



United States
Department of
Agriculture

In cooperation
with the
Texas AgriLife
Research



Natural
Resources
Conservation
Service

Soil Survey of Young County, Texas



How To Use This Soil Survey

General Soil Map

The general soil map, which is a color map, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section "General Soil Map Units" for a general description of the soils in your area.

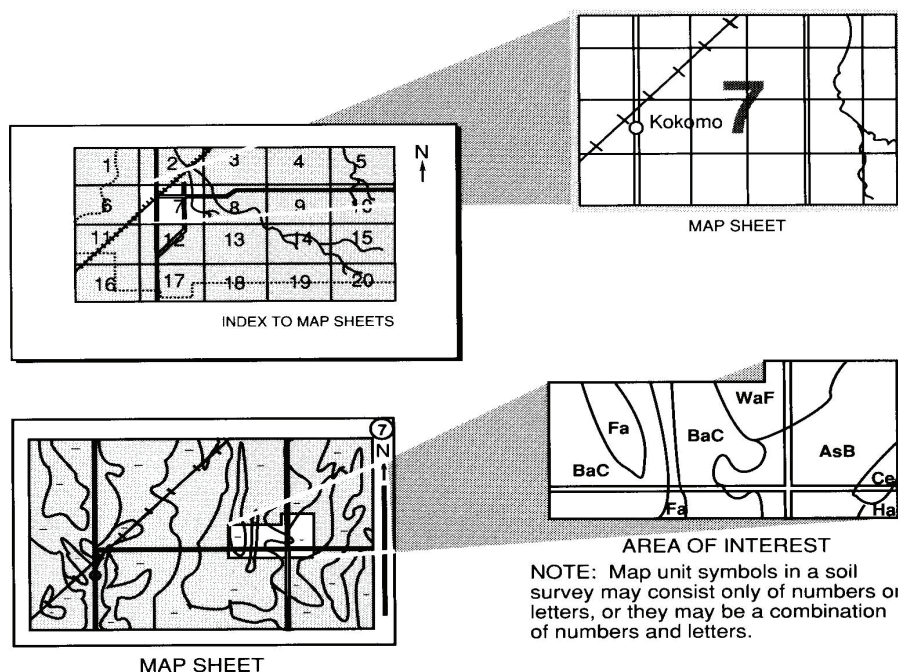
Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the "Index to Map Sheets."

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Go to the "Contents," which lists the map units by symbol and name and shows the page where each map unit is described.

The "Contents" shows which table has data on a specific land use for each detailed soil map unit. Also see the "Contents" for sections of this publication that may address your specific needs.



This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1998. Soil names and descriptions were approved in 2002. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2002. This survey was made cooperatively by the Natural Resources Conservation Service and the Texas AgriLife Research Center and the Texas State Soil and Water Conservation Board. The survey is part of the technical assistance furnished to the Young County Soil and Water Conservation District.

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Cover: Corn and flower mill on the Clear Fork of the Brazos River at Eliasville. These mills were used along the river during the early establishment of Young County. The soil is Wheatwood loam, 1 to 3 percent slopes.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service homepage on the World Wide Web. The address is <http://www.nrcs.usda.gov>

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Foreword

This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suitable for use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or Texas AgriLife Research.



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Soil Survey of Young County, Texas

By Thomas E. Cyprian, Natural Resources Conservation Services

Fieldwork by Thomas E. Cyprian, Sidney Paulson, Scott Zschetzsche, and Juliet Carter
Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with the Texas AgriLife Research

Young County is located in north central Texas (fig. 1). The county has an area of 595,463 acres. It is bordered by Archer and Baylor Counties on the north, Throckmorton on the west, Jack and Palo Pinto on the east, and Stephens and Palo Pinto on the south. Elevations range from 1,000 to 1,522 feet.

Young County was organized in 1856. Graham is located in the southeastern part of Young County and is the county seat. In 2000, the population of Graham was 8,716 and the total population of Young County was 17,943.

The main agriculture enterprise in Young County is beef cattle. About 333,459 acres or 56 percent of the county is in rangeland. The main crops are wheat, cotton, and forage sorghums. About 22 percent of the county is used for cropland.

General Nature of the Survey Area

This section provides general information about Young County. It describes the history, natural resources, and climate of the area.

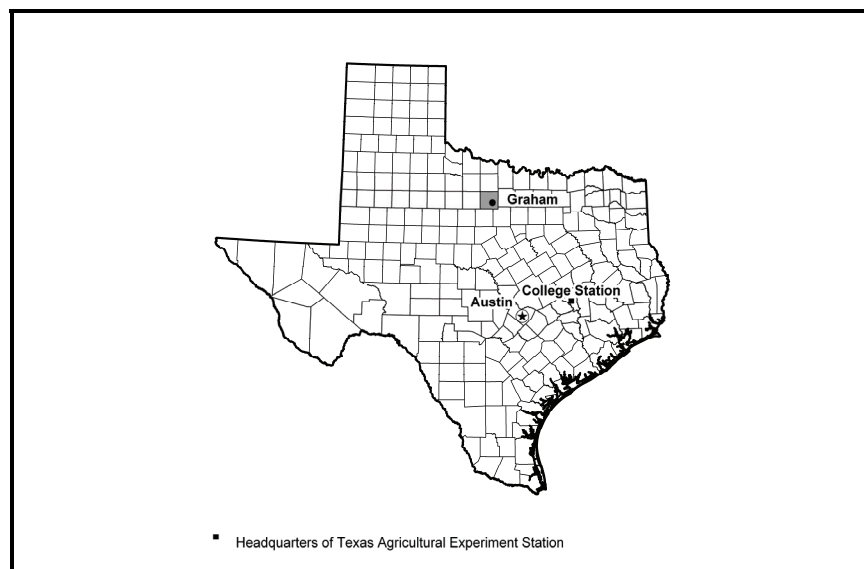


Figure 1.—Location of Young County in Texas.

History

Prepared By Pat Gracey and Dorman Holub, Young County Historical Commission

In 1851, Fort Belknap was established to protect the settlers of the area. With the protection of the fort, settlers built homes and opened stores, hotels, and blacksmith shops. The Overland Southern Pacific Mail and Stage Line ran through Belknap. In 1856, the State Legislature created Young County and Belknap became the first county seat.

Young County's population declined during the Civil War, to the extent that it was impossible to carry out county government. In 1865, Young County was attached to Jack County and the county records were sent to Flag Springs in Jack County for safekeeping.

Edwin S. and Gustavous A. Graham, both Kentuckians, came to Young County as early as 1869 and began surveying the land. By 1871, they had purchased the old salt works on Salt Creek from A. B. Gant. The salt business was not a profitable enterprise and they abandoned it to purchase land in an area 10 miles from Belknap. They wanted spacious lot sizes, a large city square, wide roads, and a community worthy of notice. The town of Graham began in 1872 and grew at a quick pace.

In 1873, E.S. Graham drilled the first gas well in the county near the old salt works. In 1874, the Texas Legislature passed an act providing for the reorganization of Young County, and Graham was selected over Belknap as the new county seat. In 1904, Judge J.F. Arnold drilled the first oil well in the county for speculation in the Miller Bend area.

Olney, the second largest town in the county, depended on ranching, farming, and oil production for its early growth. It was the first terminus of the Wichita Falls & Southern Railroad.

In 1908, the town of Newcastle became established when coal was discovered in commercial quantities. Railroad extensions were supplied to keep the coal moving through the county to points throughout the nation. The towns of Jean and Loving were located on the Gulf Texas and Western Railroad after it was laid through the county.

Eliasville was a town of prominence with the only corn and flour water mill west of Fort Worth, which flourished on the banks of the Clear Fork River.

In 1917, the first commercial oil well was drilled in Young County, which started the oil boom. During the boom, the towns of South Bend and Eliasville boasted a population of 20,000. The county continues to have an economic base of ranching, oil production, and tourism.

Natural Resources

Prepared by John Paclik, Resource Team Leader, Natural Resources Conservation Service, Graham, Texas.

Soil is the most important natural resource in Young County. The soils in the county are formed mainly in material weathered from sandstone, limestone, and shale. They are used for a wide range of purposes including range and pastureland for livestock as well as wildlife, forage crops, and recreation.

Oil and gas produced from numerous wells throughout the county contribute to a major part of the landowners' income. This also provides a good tax base from which public services are funded.

Water is a very precious resource in the county. Lake Graham and Lake Eddlemann provide the public water supply for Graham as well as the surrounding communities. The Brazos River splits the county, running from northwest to southeast. Possum Kingdom Lake is in the southeastern portion of the county. These lakes also provide recreation to many of the residents and visitors.

Deer, turkey, quail, and dove provide abundant hunting. Many of the landowners are making the shift from livestock only, to livestock and hunting, and even hunting and

recreation. The income from hunting is causing the landowners to take a different approach to managing their farms and ranches.

Other natural resources are sand, gravel, and limestone mining. They are used mainly for roads, concrete, and construction purposes.

Climate

Prepared by the Natural Resources Conservation Service National Water and Climate Center, Portland, Oregon.

Climate tables were created from the climate station at Graham, Texas

Thunderstorm days, relative humidity, percent sunshine, and wind information are estimated from First Order station Wichita Falls, Texas

Table 1 provides data on temperature and precipitation for the survey area as recorded at Graham in the period 1971 to 2000. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on the length of the growing season.

In winter, the average temperature is about 44 degrees F and the average daily minimum temperature is about 30 degrees. The lowest temperature on record, which occurred at Graham on December 23, 1989, is -8 degrees. In summer, the average temperature is about 82 degrees and the average daily maximum temperature is about 95 degrees. The highest temperature, which occurred at Graham on August 11, 1936, is 117 degrees.

Growing degree days are shown in Table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The average annual total precipitation is about 31 inches. Of this, about 23 inches, or 72 percent, usually falls in April through October. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 8.22 inches at Graham on October 13, 1981. Thunderstorms occur on about 50 days each year, and most occur in May.

The average seasonal snowfall is about 3 inches. The greatest snow depth at any one time during the period of record was 8.0 inches recorded in February 1895 and 7.0 inches in March 1989. On an average, there are no days in the year that have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 8.8 inches recorded on December 15, 1932.

The average relative humidity in mid-afternoon is about 51 percent. Humidity is higher at night, and the average at dawn is about 82 percent. The sun shines 80 percent of the time in summer and 60 percent in winter. The prevailing wind is from the south-southeast. Average wind speed is highest, 13 miles per hour, in April.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each

kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in adjacent survey areas. Differences are the result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey areas.

General Soil Map Units

The general soil map in this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

1. Bluegrove-Newcastle-Jolly

Loamy soils formed in residuum derived from sandstone of Pennsylvanian and Permian age

This map unit makes up about 34 percent of the county. It is about 22 percent Bluegrove soils, 11 percent Newcastle soils, 10 percent Jolly soils, and 57 percent soils of minor extent (fig. 2).

Bluegrove soils are moderately slowly permeable and moderately deep. Newcastle soils are moderately permeable and moderately deep. Jolly soils are moderately permeable and shallow.

Bluegrove soils are on ridges and structural benches. Newcastle soils are on ridges. Jolly soils are on ridges.

Bluegrove soils typically have a surface layer of brown fine sandy loam. The subsoil is reddish brown or dark reddish brown clay loam or clay. The underlying material is sandstone. The soils are slightly acid or neutral throughout.

Newcastle soils typically have a surface layer of slightly acid, brown fine sandy loam. The subsoil is yellowish red to reddish yellow sandy clay loam. It is slightly alkaline in the upper part and moderately alkaline in the lower part. The underlying material is moderately alkaline noncemented sandstone bedrock.

Jolly soils typically have a surface layer of brown fine sandy loam. It is slightly acid in the upper part and neutral in the lower part. The subsoil is neutral, brown sandy clay loam. The lower part is very paragravelly sandy clay loam. The underlying material is weakly cemented sandstone.

Soils that are of minor extent in this map unit are Anocon, Bonti, Callahan, Gowen, Grandfield, Knoco, Shatruce, Truce, Vernon, and Weswind soils. Anocon and Gowen soils have a dark colored surface layer and subsoil 10 to 40 inches thick. Anocon soils are on footslopes and Gowen soils are on flood plains. Bonti soils are on similar positions, but have a clayey subsoil and are more acid. Callahan, Knoco, Shatruce, Truce, Vernon, and Weswind soils are underlain by shale and occupy side slopes below sandstone outcrops. Grandfield soils are on stream terraces.

The soils in this map unit are used mainly as pasture or rangeland. Some areas are used as cropland.

Most of the pasture and hayland supports improved bermudagrass and kleingrass.

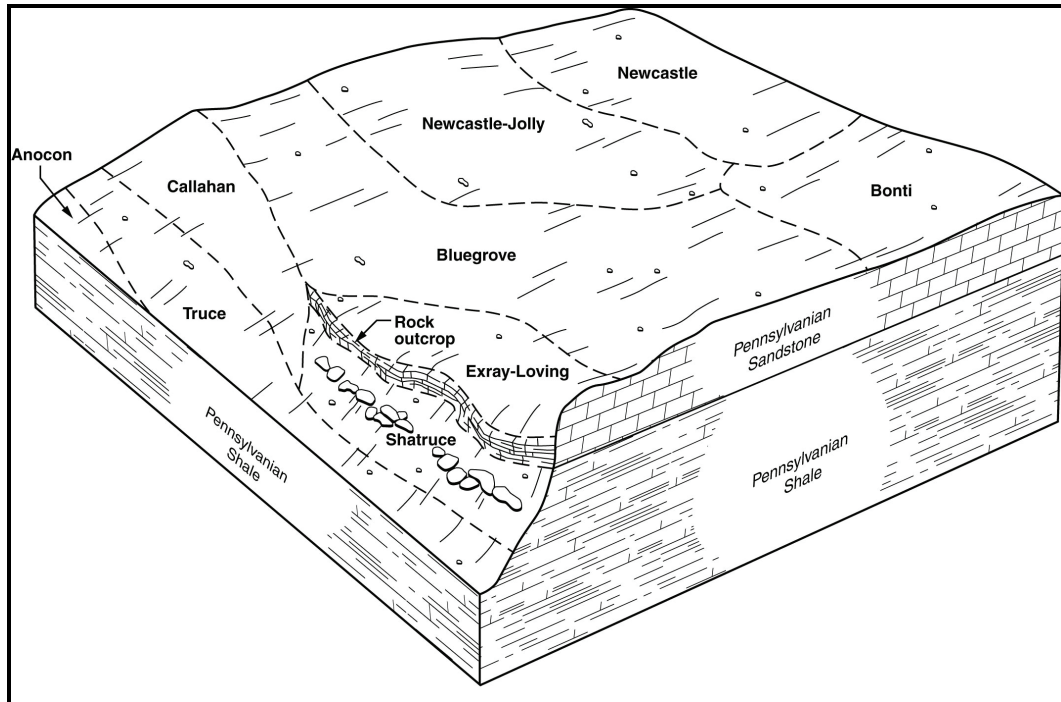


Figure 2.—Pattern of soils and underlying material in the Bluegrove-Newcastle-Jolly general soil map unit.

The climax vegetation in areas of rangeland is a mixture of mid and tall grasses with mainly little bluestem, silver bluestem, sideoats grama, and other grasses and forbs. The main crops are small grain and forage sorghum.

2. Shatruce-Exray-Loving

Loamy soils formed in residuum derived from claystone of Pennsylvanian age

This map unit makes up about 30 percent of the county. It is about 27 percent Shatruce soils, 11 percent Exray soils, 9 percent Loving soils, and 53 percent soils of minor extent (fig. 3).

Shatruce soils are slowly permeable and moderately deep. Exray soils are moderately slowly permeable and shallow. Loving soils are moderately rapidly permeable and very shallow or shallow.

Shatruce, Exray, and Loving soils are on ridges.

Shatruce soils typically have a surface layer of grayish brown gravelly fine sandy loam. The subsoil is red to reddish yellow clay. The underlying material is claystone. The soils are neutral to moderately acid throughout.

Exray soils typically have a surface layer of brown very stony fine sandy loam. The subsoil is red clay loam. The underlying material is sandstone. The soils are neutral to slightly acid throughout.

Loving soils typically have a surface layer of slightly acid fine sandy loam. It is dark yellowish brown in the upper part and yellowish brown in the lower part. The underlying material is slightly acid, reddish yellow and yellowish red weakly cemented sandstone.

Soils that are of minor extent are Bluegrove, Bonti, Jacksboro, Jolly, Newcastle, Owens, Thurber, and Truce soils. Bluegrove, Bonti, Jolly, and Newcastle are on less sloping summits of ridges. Jacksboro soils are on summits of the highest ridges. Owens

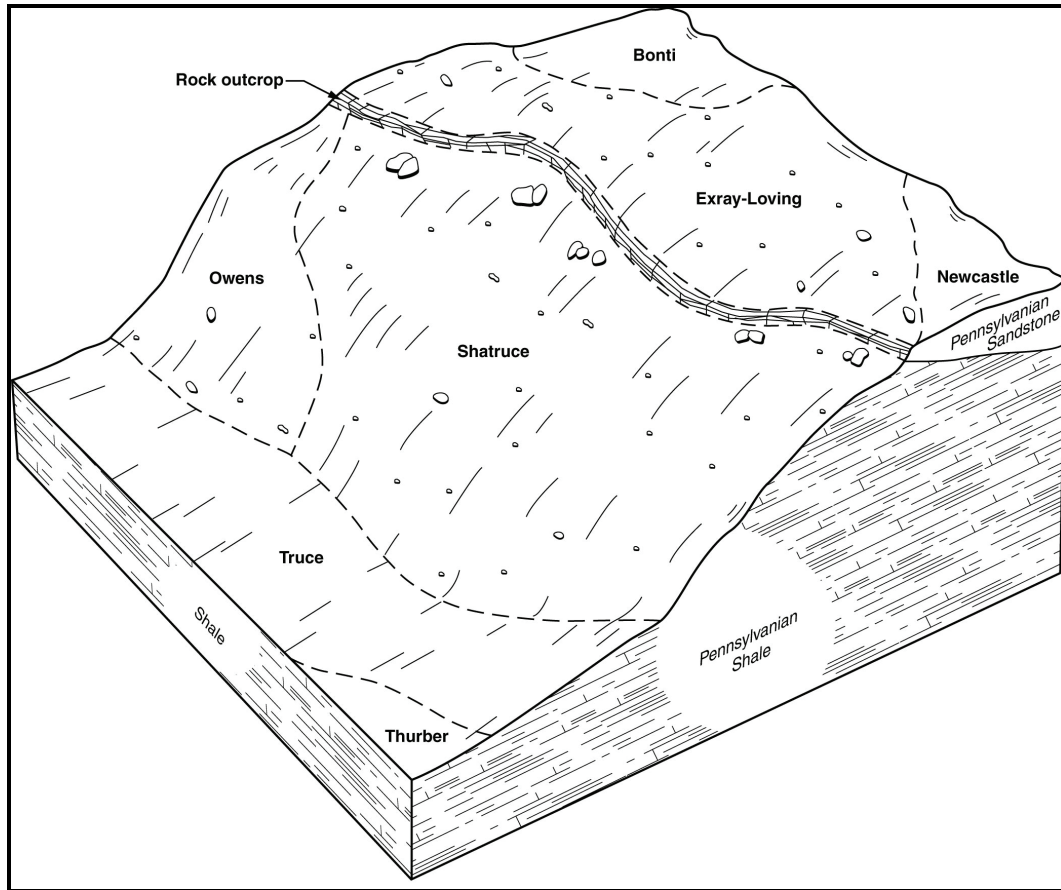


Figure 3.—Pattern of soils and underlying material in the Shatruce-Exray-Loving general soil map unit.

soils are on similar landscape positions. Thurber soils are on toeslopes and Truce soils occupy footslopes and are underlain by claystone.

The soils in this map unit are used mainly as rangeland.

The climax vegetation in areas of rangeland is a mixture of mid and tall grasses with mainly little bluestem, silver bluestem, sideoats grama, and other grasses and forbs.

3. Grandfield-Gowen

Loamy soils formed in Pleistocene and Holocene age alluvial sediments along major streams and rivers

This map unit makes up about 10 percent of the county. It is about 30 percent Grandfield soils, 11 percent Gowen soils, and 59 percent soils of minor extent.

Grandfield soils are moderately permeable and very deep. Gowen soils are moderately permeable and very deep.

Grandfield soils are on terraces on uplands in loamy and sandy sediments of Pleistocene age. Gowen soils are on flood plains of wide creeks of Holocene age. (fig. 4)

Grandfield soils typically have a surface layer of light brown loamy fine sand. The subsoil is red sandy clay loam.

Gowen soils typically have a neutral surface layer of very dark grayish brown and brown loam. The subsoil is moderately alkaline, brown or dark grayish brown loam and sandy clay loam.

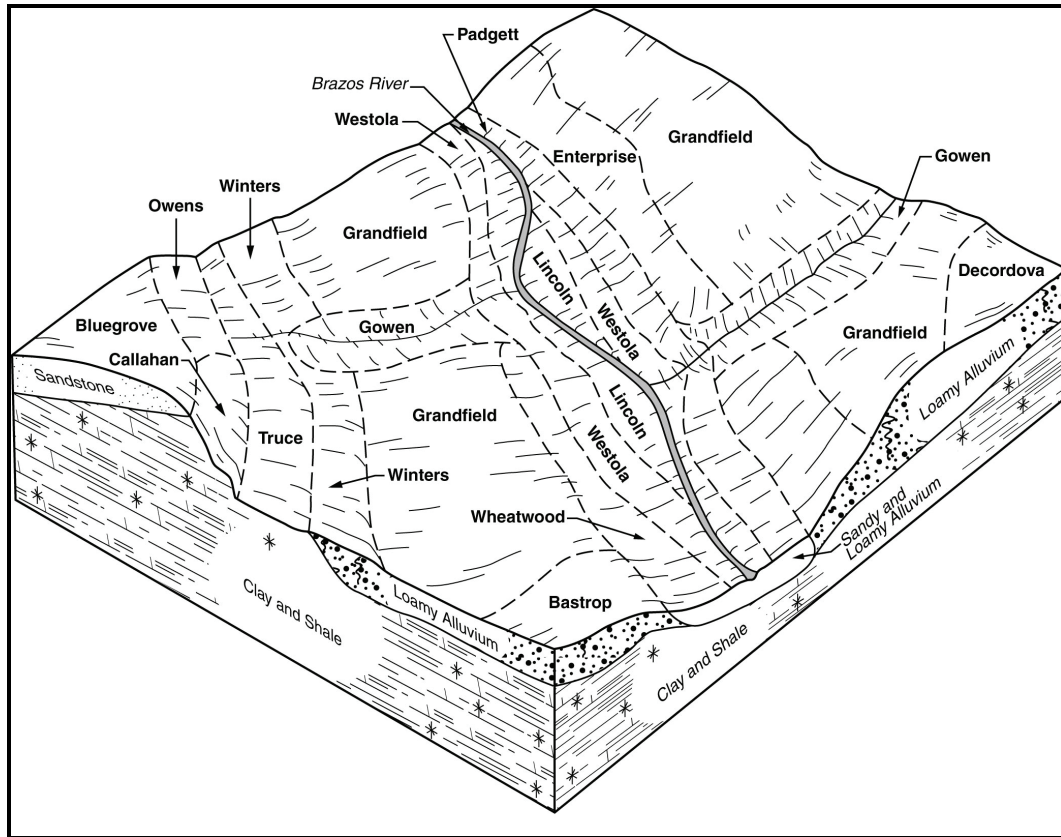


Figure 4.—Pattern of soils and underlying material in the Grandfield-Gowen and the Lincoln-Westola-Padgett general soil map units.

Soils that are of minor extent in this map unit are Bluegrove, Callahan, Decordova, Enterprise, Minwells, Owens, Truce, and Winters soils. Bluegrove, Callahan, Owens, and Truce soils are on ridges and formed in residuum of sandstone and shale. Decordova and Enterprise soils have a sandier subsoil, and Minwells and Winters soils have a clayey subsoil.

The soils in this map unit are used mainly as rangeland or pasture. Some areas are used as cropland.

The climax vegetation in areas of rangeland is mid to tall grass prairies with post oak, live oak, scattered pecan, and other trees. The main plants are little bluestem, scattered big bluestem, sideoats grama, Texas grama, and other grasses and forbs. Most of the pastures support improved bermudagrass.

The major crops are small grain and forage sorghum. Flooding is a limitation on the Gowen soils.

Grandfield soils are well suited to urban uses. The hazard of flooding limits development on the Gowen soil.

4. Tillman-Vernon

Clayey soils formed in residuum from Permian claystone

This map unit makes up about 8 percent of the county. It is 24 percent Tillman soils, 21 percent Vernon soils, and 55 percent soils of minor extent.

Tillman soils are slowly permeable and very deep. Vernon soils are very slowly permeable and moderately deep.

Tillman soils are on ridges on alluvial plains. Vernon soils are on footslopes of ridges.

Tillman soils typically have a surface layer of brown clay loam. The subsoil is brown to yellow clay. The soils are moderately alkaline throughout.

Vernon soils typically have a surface layer of reddish brown clay. The subsoil is reddish brown clay. The soils are moderately alkaline throughout.

Soils that are of minor extent in this map unit are Bluegrove, Kamay, Knoco, and Newcastle soils. Bluegrove and Newcastle soils are on higher landscape positions and formed in sandstone bedrock. Kamay soils have a surface that is massive and hard when dry, and Knoco soils are shallow over Permian red beds.

The soils in this map unit are used as cropland, pasture, and rangeland.

These soils are suited to cropland. Adapted crops include cotton, forage sorghum, grain sorghum, and small grain. Kleingrass, King Ranch bluestem, and old world bluestem are adapted pasture plants.

The native vegetation is mid grass prairie with mainly buffalograss, grama grass, vine mesquite, Texas wintergrass, and other native grasses. Trees include live oak, elm, and hackberry.

5. Sagerton

Loamy soil formed in Pleistocene age alluvial sediments along local streams

This map unit makes up about 8 percent of the county. It is 42 percent Sagerton soils and 58 percent soils of minor extent (fig. 5).

Sagerton soils are moderately slowly permeable and very deep. Sagerton soils are on paleoterraces.

Sagerton soils typically have a surface layer of dark grayish brown loam. The subsoil is brown, yellowish brown, light brown, reddish yellow, and strong brown clay loam. The soils are moderately alkaline throughout.

Soils that are of minor extent in this map unit are Abilene, Gowen, Knoco, Leeray, Nukrum, Tillman, and Vernon. Abilene soils are in lower landscape positions and have a deeper dark colored surface layer. Gowen soils are loamy and are on flood plains of local streams. Knoco, Tillman, and Vernon soils formed in clayey residuum. Leeray and Nukrum have a clayey surface layer and are in linear to concave positions.

This map unit is used mainly for cropland, rangeland, and pasture.

The major crops are small grain, forage sorghum, and grain sorghum. Some areas are used for cotton, but the moderate available water capacity may limit yields.

The native vegetation is a tall and mid grass prairie with mainly little bluestem, indiangrass, big bluestem, sideoats grama, and other native grasses. Trees include post oak, live oak, elm, hackberry, and pecan.

Improved bermudagrass, kleingrass, king ranch bluestem, and old world bluestem are adapted pasture plants.

The nearly level topography and slow runoff require proper design for houses and roads to compensate for the clayey soils. The design of septic tank absorption fields should overcome restricted water movement, or alternative systems should be used.

6. Set-Palopinto-Lindy

Loamy and stony soils formed mainly in residuum derived from limestone

This map unit makes up about 5 percent of the county. It is about 14 percent Set soils, 13 percent Palopinto, 12 percent Lindy soils, and 61 percent soils of minor extent.

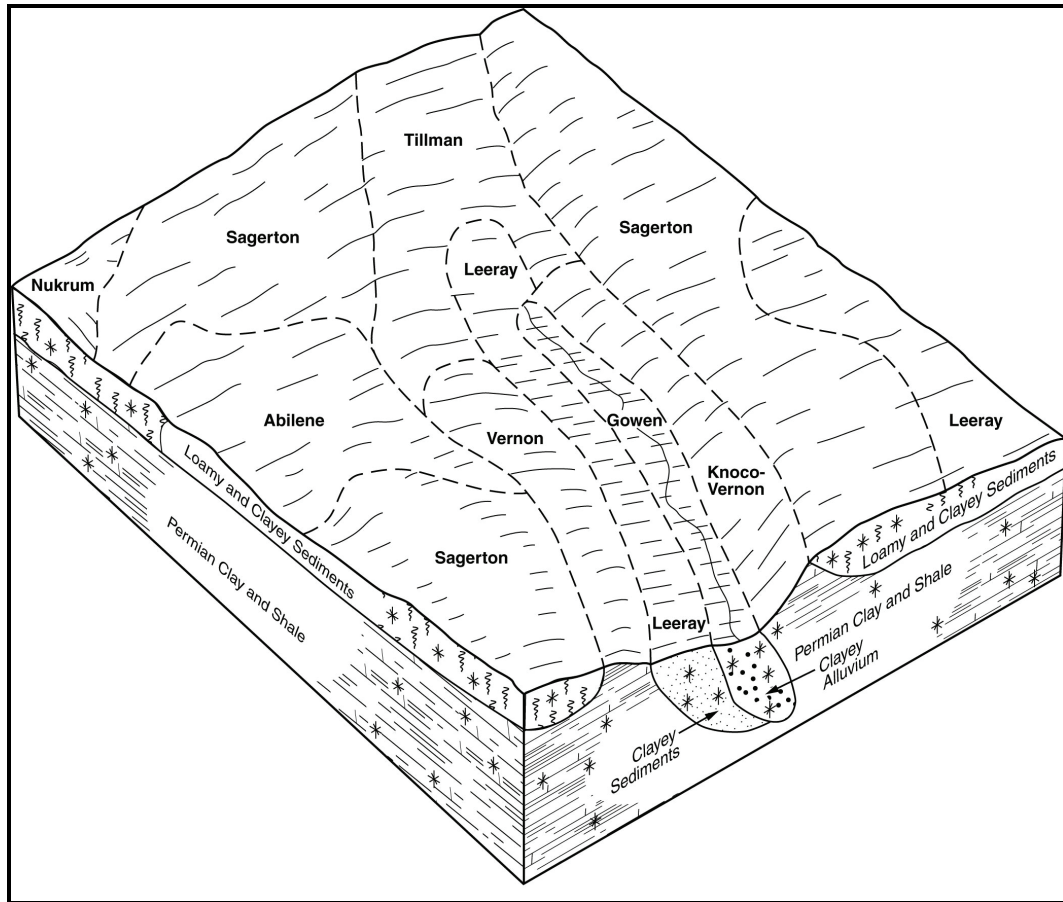


Figure 5.—Pattern of soils and underlying material in the Sagerton general soil map unit.

Set soils are slowly permeable and deep. Palopinto soils are moderately permeable and very shallow or shallow. Lindy soils are moderately permeable and moderately deep.

Set soils are on footslopes and steep stony escarpments. Palopinto soils are on ridges and hillsides. Lindy soils are on ridges.

Set soils typically have a surface layer of dark grayish brown very stony clay loam. The subsurface layer is light yellowish brown and very pale brown clay. The underlying material is light gray shale. The soils are moderately alkaline.

Palopinto soils typically have a surface layer of dark grayish brown extremely stony loam over limestone bedrock. The soils are moderately alkaline.

Lindy soils have a surface layer of brown loam. The subsoil is reddish brown or red clay loam or clay. The underlying material is limestone. The soils are neutral to slightly alkaline.

Soils that are of minor extent in this map unit are Hensley, Leeray, Owens, Rowden, Throck and Truce. Hensley and Rowden soils are on similar landscapes. Owens, Throck, and Truce soils are underlain by shale. Leeray soils are clayey in the surface and subsoil.

The soils in this map unit are used for cropland, rangeland, and pasture.

Many areas of moderately deep soils are used for crops, mainly small grain, and grain sorghum. Improved bermudagrass, kleingrass, King Ranch bluestem, and old world bluestem are adapted pasture plants.

The native vegetation is tall and mid grass prairie with mainly little bluestem, indiagrass, sideoats grama, switchgrass, and other grasses. Live oak, elm, hackberry, ash, and juniper trees are common along breaks.

The scenic hills and valleys provide desirable homesites. The limestone bedrock is a good foundation for houses and roads, but is difficult to excavate. Installing septic tank absorption fields in the limestone is difficult. Groundwater should be protected from effluent contamination.

7. Lincoln-Westola-Padgett

Loamy and clayey soils formed in Pleistocene and Holocene age alluvial sediments on the Brazos River flood plain

This map unit makes up about 4 percent of the county. It is about 33 percent Lincoln soils, 18 percent Westola soils, about 12 percent Padgett soils, and 37 percent soils of minor extent.

Lincoln soils are rapidly permeable and very deep. Westola soils are moderately rapidly permeable and very deep. Padgett soils are very slowly permeable and very deep.

Lincoln soils are on sandy fluvial sediments of recent deposits that are generally closer to the river, in the slightly higher areas of overbank deposits near stream meanders (fig. 4). Westola soils occur farther from the stream channel and at slightly higher elevations. Padgett soils occur on the outer part of the flood plain and in sloughs or meander scars. These soils are occasionally flooded.

Lincoln soils typically have a surface layer of reddish yellow sandy loam. The subsoil is pink fine sand. The soils are slightly alkaline throughout.

Westola soils typically have a surface layer of reddish yellow and reddish brown loam. The underlying material is reddish yellow very fine sandy loam. The soils are moderately alkaline.

Padgett soils typically have a surface layer of reddish brown clay. The underlying material is reddish brown clay. The soils are moderately alkaline.

Soils that are of minor extent in this map unit are Clairemont, Clearfork, Mangum, and Wheatwood. Clairemont, Mangum, and Wheatwood soils do not have a dark colored surface layer. Clearfork soils have a dark colored surface layer. Clairemont and Wheatwood soils are on similar areas and have a light colored surface layer.

The soils in this map unit are used mainly as pasture, rangeland, or cropland.

Most of the improved pastures support improved bermudagrass. Some areas are in forage sorghum and some small fields are managed for johnsongrass hay fields.

The climax vegetation in areas of rangeland consists of tall native grasses, mostly little bluestem, with scattered big bluestem and switchgrass. The woody vegetation includes scattered pecan, cottonwood, elm, and live oak trees.

The major crops are small grain and forage sorghum.

The hazard of flooding limits urban development.

8. Clearfork-Wheatwood

Loamy soils formed in alluvium on the Clearfork of the Brazos River flood plain

This map unit makes up about 1 percent of the county. It is about 49 percent Clearfork soils, 36 percent Wheatwood soils, and 15 percent soils of minor extent.

Clearfork soils are moderately slowly permeable and very deep. Wheatwood soils are moderately permeable and very deep.

Clearfork and Wheatwood soils are on flood plains. They are occasionally flooded.

Clearfork soils typically have a surface layer of reddish brown silty clay loam. The subsoil is dark reddish gray and reddish brown silty clay loam.

Wheatwood soils typically have a surface layer of light brown loam. The subsoil is brown, light brown, or reddish yellow loam, clay loam, and fine sandy loam.

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Soils that are of minor extent in this map unit are Gageby, Gowen, Grandfield, Harpersville, Lincoln, Padgett, Owens, and Westola. Gageby and Gowen soils have a dark colored surface layer and are on flood plains of small tributaries. Grandfield soils are on terraces and have a layer of clay accumulation. Lincoln and Westola soils are sandier. Padgett soils have shrink swell properties. Owens and Harpersville soils are underlain with shale and are on uplands.

The soils in this map unit are used mainly as cropland and pasture.

The major crops are small grain, forage sorghum, and improved bermudagrass. Adapted crops include cotton, small grain, and forage sorghum. Improved bermudagrass and kleingrass are adapted pasture plants.

The native vegetation is a tall grass prairie with scattered pecan, cottonwood, and elm trees. The dominant grasses are little bluestem, indiagrass, switchgrass, and big bluestem.

The hazard of flooding limits these soils as homesites. Although protected, these areas have the potential for flooding. The hazard of flooding limits urban development and some recreational uses.

Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and provides the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a soil series. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Callahan loam, 2 to 5 percent slopes, moderately eroded is a phase of the Callahan series

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes or undifferentiated groups.

A *complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Exray-Loving complex, 1 to 8 percent slopes, extremely stony is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Oil-Waste land is an example.

Table 4 provides the acreage and proportionate extent of each map unit. Other tables provide properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

For more information about managing map units, see the section on "Soil Properties," and the section on "Use and Management" which includes subsections on "Engineering," "Rangeland," "Recreation," and "Wildlife Habitat."

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one or several major kinds of soils. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. Similarly to other natural objects, soils have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. Composition is based on observations, descriptions, and or transects of the mapunit. In the detailed soil map units, these latter soils are called inclusions or included soils. In the general soil map units, they are called soils of minor extent.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called similar inclusions. They are mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are called contrasting inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern is so complex that it is impractical to make enough observations to identify all of the kinds of soils on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

AbA—Abilene loam, 0 to 1 percent slopes

Setting

Major land resource area: MLRA 78C—Central Rolling Red Plains, Eastern Part

Elevation: 1,245 to 2,745 feet (381 to 838 meters)

Mean annual precipitation: 21 to 29 inches (533 to 737 millimeters)

Mean annual air temperature: 61 to 66 degrees F (16 to 19 degrees C)

Frost-free period: 210 to 240 days

Map unit Prime Farmland class: All areas are prime farmland

Composition

Abilene and similar soils: 85 percent

Contrasting soils: 15 percent

- Nukrum, Leeray, and Sagerton soils

Soil Description

Abilene

Landscape: River valleys

Landforms: Remnant paleoterraces

Geomorphic positions, three-dimensional: Riser

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Loamy alluvium

Typical Profile

A—0 to 9 inches; slightly alkaline loam

Bt1, Bt2, Btk—9 to 37 inches; slightly alkaline clay

Bk, BCK1, BCK2—37 to 80 inches; moderately alkaline silty clay loam

Properties and Qualities

Slope: 0 to 1 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 9.3 inches (High)

Natural drainage class: Well drained

Runoff: Negligible

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 2c

Land capability irrigated: 1

Ecological site name: Clay Loam 23-30" PZ

Ecological site number: R078CY096TX

Use and Management

Major Use: Cropland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion if adequate cover is not present

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Moderate potential for shrinking and swelling

AnB—Anocon fine sandy loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies

Elevation: 1,000 to 1,295 feet (305 to 396 meters)

Mean annual precipitation: 28 to 32 inches (711 to 813 millimeters)

Mean annual air temperature: 64 to 65 degrees F (18 to 18 degrees C)

Frost-free period: 220 to 230 days

Map unit Prime Farmland class: All areas are prime farmland

Composition

Anocon and similar soils: 90 percent

Contrasting soils: 10 percent

- Bluegrove, Truce, and Weswind soils

Soil Description

Anocon

Landscape: Hills

Landforms: Ridges

Geomorphic positions, two-dimensional: Toeslope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Slope alluvium and/or slope colluvium

Typical Profile

A, AB—0 to 18 inches; neutral fine sandy loam

Bt1, Bt2, Bt3—18 to 56 inches; neutral clay

B Ct1, B Ct2—56 to 80 inches; slightly alkaline clay loam

Properties and Qualities

Slope: 1 to 3 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

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Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 8.4 inches (Moderate)

Natural drainage class: Well drained

Runoff: Medium

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 2e

Ecological site name: Loamy Prairie 26-33" PZ

Ecological site number: R080BY152TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion if adequate cover is not present

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

BgB—Bluegrove fine sandy loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies

Elevation: 925 to 1,800 feet (282 to 549 meters)

Mean annual precipitation: 24 to 32 inches (610 to 813 millimeters)

Mean annual air temperature: 62 to 68 degrees F (17 to 20 degrees C)

Frost-free period: 215 to 235 days

Map unit Prime Farmland class: Not prime farmland

Composition

Bluegrove and similar soils: 90 percent

Contrasting soils: 10 percent

- Callahan, Jolly, Newcastle, and Truce soils

Soil Description

Bluegrove

Landscape: Hills

Landforms: Ridges, structural benches

Geomorphic positions, two-dimensional: Summit

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Loamy residuum weathered from sandstone

Typical Profile

A—0 to 5 inches; slightly acid fine sandy loam
Bt1, Bt2, Bt3, BCt—5 to 34 inches; neutral clay
Cr—34 to 60 inches; bedrock

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: 20 to 40 inches (paralithic bedrock)
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)
Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 5.8 inches (Low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Tight Sandy Loam 26-33" PZ
Ecological site number: R080BY164TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Hazard of water erosion
- Restricted rooting zone

Pastureland Limitations

- Restricted rooting zone
- Seepage in pond sites

Rangeland Limitations

- Restricted rooting zone
- Seepage in pond sites

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling
- Depth to bedrock (hard or soft)

BoB—Bonti fine sandy loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 80B—Texas North-Central Prairies
Elevation: 1,200 to 1,695 feet (366 to 518 meters)
Mean annual precipitation: 26 to 32 inches (660 to 813 millimeters)
Mean annual air temperature: 64 to 67 degrees F (18 to 19 degrees C)

Frost-free period: 215 to 230 days

Map unit Prime Farmland class: Prime farmland, if irrigated

Composition

Bonti and similar soils: 85 percent

Contrasting soils: 15 percent

- Bluegrove, Exray, Shatruce, and Truce soils

Soil Description

Bonti

Landscape: Hills

Landforms: Ridges, structural benches

Geomorphic positions, two-dimensional: Summit

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Loamy residuum weathered from sandstone

Typical Profile

A, E—0 to 8 inches; slightly acid fine sandy loam

Bt1, Bt2—8 to 26 inches; moderately acid clay

Cr—26 to 60 inches; bedrock

Properties and Qualities

Slope: 1 to 3 percent

Percent of area covered by surface fragments: Not specified

Depth to first restrictive layer: 20 to 40 inches (paralithic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 3.7 inches (Low)

Natural drainage class: Well drained

Runoff: Medium

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e

Ecological site name: Sandy Loam 26-33" PZ

Ecological site number: R080BY159TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Restricted rooting zone
- Hazard of water and wind erosion
- Low fertility

Pastureland Limitations

- Restricted rooting zone
- Seepage in pond sites

Rangeland Limitations

- Restricted rooting zone
- Seepage in pond sites

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling
- Depth to bedrock (hard or soft)

BpC—Bastrop loamy fine sand, 1 to 5 percent slopes

Setting

Major land resource area: MLRA 80B—Texas North-Central Prairies

Elevation: 735 to 1,200 feet (225 to 366 meters)

Mean annual precipitation: 28 to 37 inches (700 to 952 millimeters)

Mean annual air temperature: 64 to 70 degrees F (18 to 21 degrees C)

Frost-free period: 220 to 270 days

Map unit Prime Farmland class: Prime farmland, if irrigated

Composition

Bastrop and similar soils: 90 percent

Contrasting soils: 10 percent

- Enterprise, Minwells, and Winters soils

Soil Description

Bastrop

Landscape: River valleys

Landforms: Stream terraces

Geomorphic positions, three-dimensional: Tread

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Loamy alluvium

Typical Profile

A—0 to 15 inches; neutral loamy fine sand

Bt1—15 to 45 inches; neutral sandy clay loam

Bt2—45 to 80 inches; neutral sandy clay loam

Properties and Qualities

Slope: 1 to 5 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 8.5 inches (Moderate)

Natural drainage class: Well drained

Runoff: Low

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e

Ecological site name: Loamy Sand 26-33" PZ

Ecological site number: R080BY153TX

Use and Management

Major Use: Pastureland

Cropland Limitations

- Low fertility
- Low soil moisture in periods of inadequate rainfall
- Hazard of water and wind erosion

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall
- Seepage in pond sites

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall
- Seepage in pond sites

Urban Use Limitations

- There are no major limitations that affect this use.

BsB—Bastrop fine sandy loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 80B—Texas North-Central Prairies

Elevation: 735 to 1,200 feet (225 to 366 meters)

Mean annual precipitation: 28 to 37 inches (700 to 952 millimeters)

Mean annual air temperature: 64 to 70 degrees F (18 to 21 degrees C)

Frost-free period: 220 to 270 days

Map unit Prime Farmland class: All areas are prime farmland

Composition

Bastrop and similar soils: 85 percent

Contrasting soils: 15 percent

- Enterprise, Minwells, and Winters soils

Soil Description

Bastrop

Landscape: River valleys

Landforms: Stream terraces

Geomorphic positions, three-dimensional: Tread

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Loamy alluvium

Typical Profile

A1, A2—0 to 13 inches; neutral fine sandy loam

Bt1, Bt2, Bt3, Bt4, BCtk—13 to 80 inches; neutral sandy clay loam

Properties and Qualities

Slope: 1 to 3 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 9.8 inches (High)

Natural drainage class: Well drained

Runoff: Low

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 2e

Ecological site name: Sandy Loam 26-33" PZ

Ecological site number: R080BY159TX

Use and Management

Major Use: Pastureland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall
- Seepage in pond sites

Urban Use Limitations

- There are no major limitations that affect this use.

BsC2—Bastrop fine sandy loam, 1 to 5 percent slopes, moderately eroded

Setting

Major land resource area: MLRA 80B—Texas North-Central Prairies

Elevation: 735 to 1,200 feet (225 to 366 meters)

Mean annual precipitation: 28 to 37 inches (700 to 952 millimeters)

Mean annual air temperature: 64 to 70 degrees F (18 to 21 degrees C)

Frost-free period: 220 to 270 days

Map unit Prime Farmland class: Not prime farmland

Composition

Bastrop eroded and similar soils: 85 percent

Contrasting soils: 15 percent

- Enterprise, Minwells, and Winters soils

Soil Description

Bastrop Eroded

Landscape: River valleys

Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium

Typical Profile

A—0 to 4 inches; neutral fine sandy loam
Bt1—4 to 50 inches; neutral sandy clay loam
Bt2—50 to 80 inches; neutral sandy clay loam

Properties and Qualities

Slope: 1 to 5 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.8 inches (High)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Sandy Loam 26-33" PZ
Ecological site number: R080BY159TX

Use and Management

Major Use: Pastureland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall
- Seepage in pond sites

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall
- Seepage in pond sites

Urban Use Limitations

- There are no major limitations that affect this use.

CaC2—Callahan loam, 2 to 5 percent slopes, moderately eroded

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies
Elevation: 845 to 2,295 feet (259 to 701 meters)
Mean annual precipitation: 24 to 30 inches (610 to 762 millimeters)

Soil Survey of Young County, Texas

Mean annual air temperature: 64 to 67 degrees F (18 to 19 degrees C)

Frost-free period: 220 to 250 days

Map unit Prime Farmland class: Not prime farmland

Composition

Callahan and similar soils: 90 percent

Contrasting soils: 10 percent

- Bluegrove, Newcastle, and Truce soils

Soil Description

Callahan

Landscape: Hills

Landforms: Low ridges

Geomorphic positions, two-dimensional: Backslope

Down-slope shape: Concave

Across-slope shape: Convex

Parent material: Clayey residuum weathered from claystone

Typical Profile

Ap—0 to 5 inches; slightly alkaline loam

Bt, Btk—5 to 34 inches; moderately alkaline clay

Cd1—34 to 50 inches; slightly alkaline clay

Cd2—50 to 60 inches; slightly alkaline clay

Cd3—60 to 64 inches; sandstone bedrock

Properties and Qualities

Slope: 2 to 5 percent

Depth to first restrictive layer: 20 to 40 inches (densic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 5.2 inches (Low)

Natural drainage class: Well drained

Runoff: High

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 4e

Ecological site name: Claypan Prairie 26-33" PZ

Ecological site number: R080BY147TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Hazard of water erosion
- Restricted rooting zone

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

ChB—Chaney loamy fine sand, 0 to 3 percent slopes

Setting

Major land resource area: MLRA 80B—Texas North-Central Prairies

Elevation: 600 to 1,745 feet (183 to 533 meters)

Mean annual precipitation: 24 to 32 inches (610 to 813 millimeters)

Mean annual air temperature: 64 to 67 degrees F (18 to 19 degrees C)

Frost-free period: 210 to 240 days

Map unit Prime Farmland class: Prime farmland, if irrigated

Composition

Chaney and similar soils: 85 percent

Contrasting soils: 15 percent

- Bluegrove, Truce, and Weswind soils

Soil Description

Chaney

Landscape: River valleys

Landforms: Strath terraces

Geomorphic positions, three-dimensional: Tread

Down-slope shape: Linear

Across-slope shape: Concave

Parent material: Clayey alluvium

Typical Profile

Ap, A2—0 to 12 inches; slightly acid loamy fine sand

Bt1, Bt2—12 to 46 inches; slightly acid clay

BCtk—46 to 57 inches; neutral clay

Cd—57 to 80 inches; neutral clay

Properties and Qualities

Slope: 0 to 3 percent

Depth to first restrictive layer: 40 to 60 inches (densic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 7.6 inches (Moderate)

Natural drainage class: Moderately well drained

Runoff: High

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e

Ecological site name: Loamy Sand 26-33" PZ

Ecological site number: R080BY153TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Low fertility

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

CkA—Clearfork silty clay loam, 0 to 1 percent slopes, occasionally flooded

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies

Elevation: 1,000 to 1,295 feet (305 to 396 meters)

Mean annual precipitation: 24 to 30 inches (610 to 762 millimeters)

Mean annual air temperature: 62 to 65 degrees F (17 to 18 degrees C)

Frost-free period: 214 to 225 days

Map unit Prime Farmland class: All areas are prime farmland

Composition

Clearfork and similar soils: 90 percent

Contrasting soils: 10 percent

- Padgett, Westola, and Wheatwood soils

Soil Description

Clearfork

Landscape: River valleys

Landforms: Flood plains

Down-slope shape: Linear

Across-slope shape: Concave

Parent material: Clayey alluvium

Typical Profile

A1, A2, A3—0 to 28 inches; moderately alkaline silty clay loam

Bw1, Bw2, Bw3—28 to 80 inches; moderately alkaline silty clay loam

Properties and Qualities

Slope: 0 to 1 percent

Depth to first restrictive layer: Not present

Soil Survey of Young County, Texas

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 7.2 inches (Moderate)

Natural drainage class: Well drained

Runoff: Negligible

Flooding frequency: Occasional

Interpretive Groups

Land capability nonirrigated: 2w

Ecological site name: Loamy Bottomland 26-33" PZ

Ecological site number: R080BY151TX

Use and Management

Major Use: Cropland

Cropland Limitations

- Occasional flooding
- Low soil moisture in periods of inadequate rainfall

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Not suited to urban uses because of occasional flooding
- Slow water movement within the soil
- Potential for shrinking and swelling

DAM—Dams

Setting

Major land resource area: MLRA 80B—Texas North-Central Prairies

Mean annual precipitation: 26 to 32 inches (660 to 813 millimeters)

Mean annual air temperature: 63 to 66 degrees F (17 to 19 degrees C)

Frost-free period: 210 to 240 days

Map unit Prime Farmland class: Not prime farmland

Composition

Dams and similar soils: 100 percent

Contrasting soils: None

DeB—Decordova loamy fine sand, 0 to 3 percent slopes

Setting

Major land resource area: MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 84B—West Cross Timbers

Elevation: 530 to 1,200 feet (163 to 366 meters)

Mean annual precipitation: 28 to 37 inches (700 to 950 millimeters)

Soil Survey of Young County, Texas

Mean annual air temperature: 64 to 70 degrees F (18 to 21 degrees C)

Frost-free period: 220 to 240 days

Map unit Prime Farmland class: Prime farmland, if irrigated

Composition

Decordova and similar soils: 90 percent

Contrasting soils: 10 percent

- Bastrop, Enterprise, and Grandfield soils

Soil Description

Decordova

Landscape: River valleys

Landforms: Stream terraces

Geomorphic positions, three-dimensional: Tread

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Sandy alluvium

Typical Profile

Ap—0 to 14 inches; slightly acid loamy fine sand

Bt1, Bt2, Bt3—14 to 80 inches; neutral fine sandy loam

Properties and Qualities

Slope: 0 to 3 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (Moderately rapid)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 7.2 inches (Moderate)

Natural drainage class: Well drained

Runoff: Very low

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e

Ecological site name: Loamy Sand 29-33" PZ

Ecological site number: R084BY171TX

Use and Management

Major Use: Pastureland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Seepage in pond sites

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall
- Seepage in pond sites

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall
- Seepage in pond sites

Urban Use Limitations

- Seepage limits this soil for use as septic tank absorption fields

DnB—Deandale loam, 0 to 2 percent slopes

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies

Elevation: 895 to 1,345 feet (274 to 411 meters)

Mean annual precipitation: 27 to 30 inches (686 to 762 millimeters)

Mean annual air temperature: 63 to 65 degrees F (17 to 18 degrees C)

Frost-free period: 221 to 229 days

Map unit Prime Farmland class: All areas are prime farmland

Composition

Deandale and similar soils: 90 percent

Contrasting soils: 10 percent

- Bluegrove, Kamay, and Tillman soils

Soil Description

Deandale

Landscape: River valleys

Landforms: Stream terraces

Geomorphic positions, three-dimensional: Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Clayey alluvium

Typical Profile

Ap, A2—0 to 18 inches; neutral loam

Bt, Btk1, Btk2, Btk3, Btk4—18 to 80 inches; slightly alkaline clay

Properties and Qualities

Slope: 0 to 2 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Sodic

Representative total available water capacity to 60 inches: About 9.5 inches (High)

Natural drainage class: Moderately well drained

Runoff: Medium

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e

Land capability irrigated: 3e

Ecological site name: Claypan Prairie 24-29" PZ

Ecological site number: R080AY132TX

Use and Management

Major Use: Cropland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Sodium content is a concern during high rainfall years

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

EnB—Enterprise very fine sandy loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 78C—Central Rolling Red Plains, Eastern Part

Elevation: 1,000 to 2,095 feet (305 to 640 meters)

Mean annual precipitation: 20 to 28 inches (508 to 711 millimeters)

Mean annual air temperature: 57 to 64 degrees F (14 to 18 degrees C)

Frost-free period: 185 to 220 days

Map unit Prime Farmland class: All areas are prime farmland

Composition

Enterprise and similar soils: 85 percent

Contrasting soils: 15 percent

- Bastrop, Decordova, and Grandfield soils

Soil Description

Enterprise

Landscape: Dissected plains

Landforms: Stream terraces on river valleys

Geomorphic positions, three-dimensional: Tread

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Loamy eolian sands derived from mixed

Typical Profile

A—0 to 9 inches; slightly alkaline very fine sandy loam

Bk1, Bk2, Bk3—9 to 60 inches; moderately alkaline very fine sandy loam

Bck—60 to 80 inches; moderately alkaline very fine sandy loam

Properties and Qualities

Slope: 1 to 3 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (Moderately rapid)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 10.8 inches (High)
Natural drainage class: Well drained
Runoff: Very low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 2e
Land capability irrigated: 2e
Ecological site name: Sandy Loam Prairie 23-31" PZ
Ecological site number: R078CY110TX

Use and Management

Major Use: Cropland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall
- Seepage in pond sites

Urban Use Limitations

- Seepage limits this soil for use as septic tank absorption fields

EnC—Enterprise very fine sandy loam, 3 to 5 percent slopes

Setting

Major land resource area: MLRA 78C—Central Rolling Red Plains, Eastern Part
Elevation: 1,000 to 2,095 feet (305 to 640 meters)
Mean annual precipitation: 20 to 28 inches (508 to 711 millimeters)
Mean annual air temperature: 57 to 64 degrees F (14 to 18 degrees C)
Frost-free period: 185 to 220 days
Map unit Prime Farmland class: All areas are prime farmland

Composition

Enterprise and similar soils: 85 percent

Contrasting soils: 15 percent

- Bastrop, Decordova, and Grandfield soils

Soil Description

Enterprise

Landscape: Dissected plains
Landforms: Stream terraces on river valleys
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy eolian sands derived from mixed

Typical Profile

A—0 to 5 inches; slightly alkaline very fine sandy loam
Bk1—5 to 50 inches; moderately alkaline loam
Bk2, Bck—50 to 80 inches; moderately alkaline very fine sandy loam

Properties and Qualities

Slope: 3 to 5 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (Moderately rapid)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 10.8 inches (High)
Natural drainage class: Well drained
Runoff: Very low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e
Land capability irrigated: 3e
Ecological site name: Sandy Loam Prairie 23-31" PZ
Ecological site number: R078CY110TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall
- Seepage in pond sites

Urban Use Limitations

- Seepage limits this soil for use as septic tank absorption fields

ExD—Exray-Loving complex, 1 to 8 percent slopes, extremely stony

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 80B—Texas North-Central Prairies
Elevation: 1,000 to 1,600 feet (305 to 488 meters)
Mean annual precipitation: 26 to 31 inches (660 to 800 millimeters)
Mean annual air temperature: 64 to 66 degrees F (18 to 19 degrees C)
Frost-free period: 200 to 240 days
Map unit Prime Farmland class: Not prime farmland

Composition

Exray and similar soils: 43 percent
Loving and similar soils: 33 percent
Contrasting soils: 24 percent

- Bonti, Truce, and Shatruce soils

Soil Description

Exray

Landscape: Hills

Landforms: Ridges

Geomorphic positions, two-dimensional: Shoulder

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loamy residuum

Typical Profile

A—0 to 5 inches; neutral very stony fine sandy loam

Bt—5 to 12 inches; slightly acid clay loam

Cr—12 to 60 inches; bedrock

Properties and Qualities

Slope: 1 to 8 percent

Percent of area covered by surface fragments: About 5 percent subangular stones, about 2 percent subangular boulders, about 1 percent subangular cobbles

Depth to first restrictive layer: 10 to 20 inches (paralithic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 1.6 inches (Very low)

Natural drainage class: Well drained

Runoff: High

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s

Ecological site name: Sandstone Hill 26-33" PZ

Ecological site number: R080BY157TX

Soil Description

Loving

Landscape: Hills

Landforms: Ridges

Geomorphic positions, two-dimensional: Shoulder

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loamy residuum

Typical Profile

A1—0 to 6 inches; neutral very stony fine sandy loam
A2—6 to 16 inches; neutral fine sandy loam
Cr—16 to 60 inches; sandstone bedrock

Properties and Qualities

Slope: 1 to 8 percent
Percent of area covered by surface fragments: About 5 percent subangular stones, about 2 percent subangular boulders, about 1 percent subangular cobbles
Depth to first restrictive layer: 10 to 20 inches (paralithic bedrock)
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (Moderately rapid)
Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 2.2 inches (Very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Sandstone Hill 26-33" PZ
Ecological site number: R080BY157TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion
- Rock fragments (stoniness) hinder use of mechanical implements
- Inadequate plant available water

Pastureland Limitations

- Restricted rooting zone
- Seepage in pond sites

Rangeland Limitations

- Restricted rooting zone
- Seepage in pond sites

Urban Use Limitations

- Depth to bedrock (hard or soft)
- Slow water movement within the soil

GaB—Gageby loam, 0 to 2 percent slopes, occasionally flooded

Setting

Major land resource area: MLRA 78C—Central Rolling Red Plains, Eastern Part
Elevation: 1,045 to 2,145 feet (320 to 655 meters)

Soil Survey of Young County, Texas

Mean annual precipitation: 22 to 30 inches (559 to 762 millimeters)
Mean annual air temperature: 61 to 64 degrees F (16 to 18 degrees C)
Frost-free period: 210 to 230 days
Map unit Prime Farmland class: All areas are prime farmland

Composition

Gageby and similar soils: 90 percent
Contrasting soils: 10 percent

- Clearfork, Gageby, and Wheatwood soils

Soil Description

Gageby

Landscape: Dissected plains
Landforms: Flood plain steps on draws
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loamy alluvium

Typical Profile

A1, A2—0 to 22 inches; moderately alkaline loam
Bk1, Bk2—22 to 58 inches; moderately alkaline loam
BCk—58 to 80 inches; moderately alkaline loam

Properties and Qualities

Slope: 0 to 2 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 10.8 inches (High)
Natural drainage class: Well drained
Runoff: Negligible
Flooding frequency: Occasional

Interpretive Groups

Land capability nonirrigated: 2w
Land capability irrigated: 2w
Ecological site name: Draw 23-30" PZ
Ecological site number: R078CY099TX

Use and Management

Major Use: Cropland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Occasional flooding

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall
- Seepage in pond sites

Urban Use Limitations

- Not suited to urban uses because of occasional flooding

GdF—Goodnight loamy fine sand, 3 to 20 percent slopes

Setting

Major land resource area: MLRA 80B—Texas North-Central Prairies

Elevation: 800 to 1,495 feet (244 to 457 meters)

Mean annual precipitation: 26 to 40 inches (660 to 1,020 millimeters)

Mean annual air temperature: 56 to 64 degrees F (13 to 18 degrees C)

Frost-free period: 200 to 230 days

Map unit Prime Farmland class: Not prime farmland

Composition

Goodnight and similar soils: 90 percent

Contrasting soils: 10 percent

- Bastrop, Enterprise, and Grandfield soils

Soil Description

Goodnight

Landscape: River valleys

Landforms: Dunes on stream terraces

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Sandy eolian deposits

Typical Profile

A—0 to 18 inches; neutral loamy fine sand

C1—18 to 40 inches; neutral fine sand

C2—40 to 80 inches; neutral fine sand

Properties and Qualities

Slope: 3 to 20 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 6.0 to 20 in/hr (Rapid)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 4.4 inches (Low)

Natural drainage class: Excessively drained

Runoff: Very low

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6e

Ecological site name: Sand Hills 26-33" PZ

Ecological site number: R080BY690TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Low fertility
- Hazard of water and wind erosion
- Inadequate plant available water

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall
- Inadequate plant available water

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall
- Seepage in pond sites

Urban Use Limitations

- Seepage limits this soil for use as septic tank absorption fields
- Slope

GeA—Gowen loam, 0 to 1 percent slopes, occasionally flooded

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies

Elevation: 200 to 950 feet (61 to 290 meters)

Mean annual precipitation: 28 to 40 inches (711 to 1,016 millimeters)

Mean annual air temperature: 64 to 70 degrees F (18 to 21 degrees C)

Frost-free period: 215 to 270 days

Map unit Prime Farmland class: All areas are prime farmland

Composition

Gowen and similar soils: 90 percent

Contrasting soils: 10 percent

- Clearfork, Gageby, and Wheatwood soils

Soil Description

Gowen

Landscape: River valleys

Landforms: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Loamy alluvium

Typical Profile

A1, A2, A3, AB—0 to 30 inches; slightly alkaline loam

Bw, Ab, Bwb1, Bwb2—30 to 80 inches; slightly alkaline sandy clay loam

Properties and Qualities

Slope: 0 to 1 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)

Soil Survey of Young County, Texas

Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 10.8 inches (High)
Natural drainage class: Well drained
Runoff: Negligible
Flooding frequency: Occasional

Interpretive Groups

Land capability nonirrigated: 2w
Ecological site name: Loamy Bottomland 26-33" PZ
Ecological site number: R080BY151TX

Use and Management

Major Use: Cropland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Occasional flooding

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall
- Seepage in pond sites

Urban Use Limitations

- Not suited to urban uses because of occasional flooding

GfB—Grandfield loamy fine sand, 0 to 3 percent slopes

Setting

Major land resource area: MLRA 78C—Central Rolling Red Plains, Eastern Part
Elevation: 1,000 to 2,195 feet (305 to 670 meters)
Mean annual precipitation: 22 to 30 inches (559 to 762 millimeters)
Mean annual air temperature: 57 to 64 degrees F (14 to 18 degrees C)
Frost-free period: 185 to 230 days
Map unit Prime Farmland class: Prime farmland, if irrigated

Composition

Grandfield and similar soils: 90 percent
Contrasting soils: 10 percent

- Decordova, Enterprise, and Heaton soils

Soil Description

Grandfield

Landscape: River valleys
Landforms: Stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Calcareous loamy alluvium

Typical Profile

A—0 to 8 inches; neutral loamy fine sand
Bt1, Bt2—8 to 40 inches; neutral sandy clay loam
Bt3—40 to 56 inches; slightly alkaline sandy clay loam
BCk—56 to 80 inches; slightly alkaline fine sandy loam

Properties and Qualities

Slope: 0 to 3 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 8.0 inches (Moderate)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Loamy Sand Prairie 23-31" PZ
Ecological site number: R078CY105TX

Use and Management

Major Use: Pastureland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion if adequate cover is not present

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall
- Seepage in pond sites

Urban Use Limitations

- There are no major limitations that affect this use.

GnB—Grandfield fine sandy loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 78C—Central Rolling Red Plains, Eastern Part
Elevation: 1,000 to 2,195 feet (305 to 670 meters)
Mean annual precipitation: 22 to 30 inches (559 to 762 millimeters)
Mean annual air temperature: 57 to 64 degrees F (14 to 18 degrees C)
Frost-free period: 185 to 230 days
Map unit Prime Farmland class: Prime farmland, if irrigated

Composition

Grandfield and similar soils: 90 percent

Contrasting soils: 10 percent

- Decordova, Enterprise, and Heaton soils

Soil Description

Grandfield

Landscape: River valleys

Landforms: Stream terraces

Geomorphic positions, three-dimensional: Tread

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Calcareous loamy alluvium

Typical Profile

A—0 to 5 inches; neutral fine sandy loam

Bt1—5 to 28 inches; neutral sandy clay loam

Bt2—28 to 41 inches; slightly alkaline sandy clay loam

Bck—41 to 80 inches; slightly alkaline fine sandy loam

Properties and Qualities

Slope: 1 to 3 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 8.2 inches (Moderate)

Natural drainage class: Well drained

Runoff: Low

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 2e

Ecological site name: Sandy Loam Prairie 23-31" PZ

Ecological site number: R078CY110TX

Use and Management

Major Use: Pastureland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion if adequate cover is not present

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall
- Seepage in pond sites

Urban Use Limitations

- There are no major limitations that affect this use.

GnC—Grandfield fine sandy loam, 3 to 5 percent slopes

Setting

Major land resource area: MLRA 78C—Central Rolling Red Plains, Eastern Part

Elevation: 1,000 to 2,195 feet (305 to 670 meters)

Mean annual precipitation: 22 to 30 inches (559 to 762 millimeters)

Mean annual air temperature: 57 to 64 degrees F (14 to 18 degrees C)

Frost-free period: 185 to 230 days

Map unit Prime Farmland class: Prime farmland, if irrigated

Composition

Grandfield and similar soils: 90 percent

Contrasting soils: 10 percent

- Decordova, Enterprise, and Grandmore soils

Soil Description

Grandfield

Landscape: River valleys

Landforms: Stream terraces

Geomorphic positions, three-dimensional: Tread

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Calcareous loamy alluvium

Typical Profile

A—0 to 5 inches; neutral fine sandy loam

Bt1—5 to 18 inches; neutral sandy clay loam

Bt2—18 to 56 inches; slightly alkaline sandy clay loam

BcK—56 to 80 inches; slightly alkaline sandy clay loam

Properties and Qualities

Slope: 3 to 5 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 8.3 inches (Moderate)

Natural drainage class: Well drained

Runoff: Low

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e

Ecological site name: Sandy Loam Prairie 23-31" PZ

Ecological site number: R078CY110TX

Use and Management

Major Use: Pastureland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall
- Seepage in pond sites

Urban Use Limitations

- There are no major limitations that affect this use.

GrB—Grandmore fine sandy loam, 0 to 2 percent slopes

Setting

Major land resource area: MLRA 78C—Central Rolling Red Plains, Eastern Part

Elevation: 1,000 to 2,195 feet (305 to 670 meters)

Mean annual precipitation: 22 to 32 inches (559 to 813 millimeters)

Mean annual air temperature: 57 to 64 degrees F (14 to 18 degrees C)

Frost-free period: 185 to 230 days

Map unit Prime Farmland class: Prime farmland, if irrigated

Composition

Grandmore and similar soils: 85 percent

Contrasting soils: 15 percent

- Decordova, Enterprise, and Grandfield soils

Soil Description

Grandmore

Landscape: River valleys

Landforms: Depressions on stream terraces

Geomorphic positions, three-dimensional: Tread

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Loamy alluvium

Typical Profile

Ap, A—0 to 18 inches; slightly alkaline fine sandy loam

Bt1—18 to 38 inches; moderately alkaline sandy clay loam

2Bt1b, 2Bt2b—38 to 59 inches; moderately alkaline clay loam

2BC—59 to 80 inches; moderately alkaline loamy fine sand

Properties and Qualities

Slope: 0 to 2 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 8.5 inches (Moderate)
Natural drainage class: Moderately well drained
Runoff: Low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 2e
Ecological site name: Sandy Loam Prairie 23-31" PZ
Ecological site number: R078CY110TX

Use and Management

Major Use: Pastureland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion if adequate cover is not present

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- There are no major limitations that affect this use.

HeC—Heaton fine sand, 1 to 5 percent slopes

Setting

Major land resource area: MLRA 84B—West Cross Timbers
Elevation: 1,000 to 2,095 feet (305 to 640 meters)
Mean annual precipitation: 26 to 32 inches (660 to 813 millimeters)
Mean annual air temperature: 64 to 68 degrees F (18 to 20 degrees C)
Frost-free period: 210 to 270 days
Map unit Prime Farmland class: Not prime farmland

Composition

Heaton and similar soils: 85 percent
Contrasting soils: 15 percent

- Decordova, Enterprise, and Grandfield soils

Soil Description

Heaton

Landscape: River valleys
Landforms: High stream terraces
Geomorphic positions, three-dimensional: Tread
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy alluvium

Typical Profile

Ap, E—0 to 32 inches; slightly acid fine sand
Bt1, Bt2—32 to 61 inches; slightly acid sandy clay loam
Bt3—61 to 80 inches; neutral fine sandy loam

Properties and Qualities

Slope: 1 to 5 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 6.2 inches (Moderate)
Natural drainage class: Well drained
Runoff: Very low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Sandy 29-33" PZ
Ecological site number: R084BY172TX

Use and Management

Major Use: Pastureland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water and wind erosion
- Low fertility

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall
- Seepage in pond sites

Urban Use Limitations

- There are no major limitations that affect this use.

HnB—Hensley loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 80B—Texas North-Central Prairies
Elevation: 350 to 2,250 feet (107 to 686 meters)
Mean annual precipitation: 24 to 40 inches (610 to 1016 millimeters)
Mean annual air temperature: 64 to 66 degrees F (18 to 19 degrees C)
Frost-free period: 210 to 250 days
Map unit Prime Farmland class: Not prime farmland

Composition

Hensley and similar soils: 85 percent

Contrasting soils: 15 percent

- Lindy, Palopinto, and Rowden soils

Soil Description

Hensley

Landscape: Hills

Landforms: Ridges

Geomorphic positions, two-dimensional: Summit, shoulder

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Clayey residuum weathered from limestone

Typical Profile

A—0 to 4 inches; neutral loam

Bt—4 to 14 inches; slightly alkaline clay

R—14 to 20 inches; bedrock

Properties and Qualities

Slope: 1 to 3 percent

Depth to first restrictive layer: 10 to 20 inches (lithic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 2.3 inches (Very low)

Natural drainage class: Well drained

Runoff: High

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 4s

Ecological site name: Redland 26-33" PZ

Ecological site number: R080BY155TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion

Pastureland Limitations

- Restricted rooting zone
- Seepage in pond sites

Rangeland Limitations

- Restricted rooting zone
- Seepage in pond sites

Urban Use Limitations

- Depth to bedrock (hard or soft)
- Slow water movement within the soil
- Potential for shrinking and swelling

HsB—Hensley stony loam, 1 to 3 percent slopes, extremely stony

Setting

Major land resource area: MLRA 80B—Texas North-Central Prairies

Elevation: 350 to 2,250 feet (107 to 686 meters)

Mean annual precipitation: 26 to 40 inches (660 to 1016 millimeters)

Mean annual air temperature: 64 to 66 degrees F (18 to 19 degrees C)

Frost-free period: 210 to 250 days

Map unit Prime Farmland class: Not prime farmland

Composition

Hensley and similar soils: 85 percent

Contrasting soils: 15 percent

- Lindy, Palopinto, and Rowden soils

Soil Description

Hensley

Landscape: Hills

Landforms: Ridges

Geomorphic positions, two-dimensional: Shoulder, backslope

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Clayey residuum weathered from limestone

Typical Profile

A—0 to 5 inches; neutral extremely stony loam

Bt—5 to 14 inches; slightly alkaline clay

R—14 to 19 inches; bedrock

Properties and Qualities

Slope: 1 to 3 percent

Percent of area covered by surface fragments: About 5 percent subangular stones, about 3 percent subangular boulders, less than 1 percent subangular cobbles

Depth to first restrictive layer: 10 to 20 inches (lithic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 2.3 inches (Very low)

Natural drainage class: Well drained

Runoff: High

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s

Ecological site name: Redland 26-33" PZ

Ecological site number: R080BY155TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion
- Rock fragments (stoniness) hinder use of mechanical implements

Pastureland Limitations

- Restricted rooting zone
- Seepage in pond sites

Rangeland Limitations

- Restricted rooting zone
- Seepage in pond sites

Urban Use Limitations

- Depth to bedrock (hard or soft)
- Slow water movement within the soil
- Potential for shrinking and swelling

JaB—Jacksboro fine sandy loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 80B—Texas North-Central Prairies

Elevation: 1,200 to 1,500 feet (366 to 458 meters)

Mean annual precipitation: 26 to 30 inches (660 to 762 millimeters)

Mean annual air temperature: 64 to 65 degrees F (18 to 18 degrees C)

Frost-free period: 220 to 230 days

Map unit Prime Farmland class: Not prime farmland

Composition

Jacksboro and similar soils: 90 percent

Contrasting soils: 10 percent

- Bluegrove, Exray, and Jolly soils

Soil Description

Jacksboro

Landscape: Hills

Landforms: Ridges

Geomorphic positions, two-dimensional: Summit

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Gravelly residuum weathered from conglomerate

Typical Profile

A—0 to 4 inches; neutral fine sandy loam

E—4 to 11 inches; slightly acid very gravelly fine sandy loam

Soil Survey of Young County, Texas

Bt—11 to 18 inches; moderately acid very gravelly clay
R—18 to 25 inches; conglomerate bedrock

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: 15 to 20 inches (lithic bedrock)
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)
Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 1.7 inches (Very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s
Ecological site name: Sandstone Hill 26-33" PZ
Ecological site number: R080BY157TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion

Pastureland Limitations

- Restricted rooting zone
- Seepage in pond sites

Rangeland Limitations

- Restricted rooting zone
- Seepage in pond sites

Urban Use Limitations

- Depth to bedrock (hard or soft)
- Slow water movement within the soil
- Potential for shrinking and swelling

JrE—Jolly-Rock outcrop complex, 2 to 12 percent slopes, stony

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies
Elevation: 1,045 to 1,600 feet (320 to 488 meters)
Mean annual precipitation: 26 to 30 inches (660 to 762 millimeters)
Mean annual air temperature: 63 to 66 degrees F (17 to 19 degrees C)
Frost-free period: 210 to 240 days
Map unit Prime Farmland class: Not prime farmland

Composition

Jolly and similar soils: 68 percent
Rock Outcrop and similar soils: 17 percent
Contrasting soils: 15 percent

- Bluegrove, Exray, and Newcastle soils

Soil Description

Jolly

Landscape: Hills
Landforms: Low ridges
Geomorphic positions, two-dimensional: Shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone

Typical Profile

A—0 to 4 inches; slightly acid fine sandy loam
Bt—4 to 12 inches; neutral sandy clay loam
Cr—12 to 60 inches; neutral bedrock

Properties and Qualities

Slope: 2 to 12 percent
Percent of area covered by surface fragments: Less than 1 percent subrounded cobbles,
less than 1 percent subrounded stones
Depth to first restrictive layer: 12 to 20 inches (paralithic bedrock)
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0
in/hr (Moderate)
Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.06
to 0.2 in/hr (Slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 1.6 inches (Very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 4e
Ecological site name: Sandstone Hill 26-33" PZ
Ecological site number: R080BY157TX

Soil Description

Rock outcrop

Landscape: Hills
Landforms: Ridges
Geomorphic positions, two-dimensional: Shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandstone

Properties and Qualities

Slope: 2 to 12 percent

Depth to first restrictive layer: 0 to 2 inches (lithic bedrock)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 6.0 to 20 in/hr (Rapid)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About (Very low)

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 8s

Ecological site name: Not specified

Ecological site number: Not specified

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion

Pastureland Limitations

- Restricted rooting zone
- Seepage in pond sites

Rangeland Limitations

- Restricted rooting zone
- Seepage in pond sites

Urban Use Limitations

- Depth to bedrock (hard or soft)

KaA—Kamay silt loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies

Elevation: 1,000 to 1,295 feet (305 to 396 meters)

Mean annual precipitation: 24 to 32 inches (610 to 813 millimeters)

Mean annual air temperature: 59 to 68 degrees F (15 to 20 degrees C)

Frost-free period: 210 to 240 days

Map unit Prime Farmland class: Prime farmland, if irrigated

Composition

Kamay and similar soils: 85 percent

Contrasting soils: 15 percent

- Bluegrove, Deandale, and Tillman soils

Soil Description

Kamay

Landscape: Dissected plains

Landforms: Pediments

Geomorphic positions, two-dimensional: Toeslope

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Slope alluvium derived from clayey shale

Typical Profile

A1, A2—0 to 12 inches; neutral silt loam

Bt1, Bt2, Btk1, Btk2—12 to 52 inches; slightly alkaline clay

BCtk1, BCtk2—52 to 73 inches; moderately alkaline silty clay loam

Cr—73 to 80 inches; limestone and shale bedrock

Properties and Qualities

Slope: 1 to 3 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Sodic

Representative total available water capacity to 60 inches: About 7.8 inches (Moderate)

Natural drainage class: Well drained

Runoff: Medium

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e

Land capability irrigated: 3e

Ecological site name: Claypan Prairie 24-29" PZ

Ecological site number: R080AY132TX

Use and Management

Major Use: Cropland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion if adequate cover is not present
- Poor soil tilth
- Sodium content is a concern during high rainfall years

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

KvE—Knoco-Vernon complex, 3 to 12 percent slopes

Setting

Major land resource area: MLRA 78C—Central Rolling Red Plains, Eastern Part

Elevation: 1,000 to 2,495 feet (305 to 762 meters)

Mean annual precipitation: 20 to 30 inches (508 to 762 millimeters)

Mean annual air temperature: 57 to 66 degrees F (14 to 19 degrees C)

Frost-free period: 210 to 230 days

Map unit Prime Farmland class: Not prime farmland

Composition

Knoco and similar soils: 54 percent

Vernon and similar soils: 41 percent

Contrasting soils: 5 percent

- Bluegrove, Jolly, and Tillman soils

Soil Description

Knoco

Landscape: Dissected plains

Landforms: Ridges

Geomorphic positions, two-dimensional: Backslope

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Clayey residuum weathered from claystone

Typical Profile

A—0 to 5 inches; moderately alkaline clay

Cd1—5 to 13 inches; moderately alkaline clay

Cd2, Cd3—13 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 3 to 12 percent

Percent of area covered by surface fragments: About 3 percent subrounded gravel, about 1 percent subrounded cobbles

Depth to first restrictive layer: 3 to 20 inches (densic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 0.7 inches (Very low)

Natural drainage class: Well drained

Runoff: Very high

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s

Ecological site name: Very Shallow Clay 23-31" PZ

Ecological site number: R078CY114TX

Soil Description

Vernon

Landscape: Dissected plains

Landforms: Ridges

Geomorphic positions, two-dimensional: Backslope

Down-slope shape: Concave

Across-slope shape: Convex

Parent material: Clayey residuum weathered from claystone

Typical Profile

A—0 to 3 inches; moderately alkaline clay

Bk—3 to 25 inches; moderately alkaline clay

Cd1—25 to 53 inches; moderately alkaline clay

Cd2—53 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 3 to 8 percent

Percent of area covered by surface fragments: About 3 percent subangular boulders, about 6 percent subangular stones, about 1 percent subrounded cobbles

Depth to first restrictive layer: 20 to 40 inches (densic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Sodic

Representative total available water capacity to 60 inches: About 3.2 inches (Low)

Natural drainage class: Well drained

Runoff: Very high

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s

Ecological site name: Shallow Clay 23-30" PZ

Ecological site number: R078CY112TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion
- Rock fragments (stoniness) hinders use of mechanical implements
- Restricted rooting zone

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall
- Restricted rooting zone

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall
- Restricted rooting zone

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

KvG—Knoco-Vernon complex, 3 to 45 percent slopes, extremely bouldery

Setting

Major land resource area: MLRA 78C—Central Rolling Red Plains, Eastern Part

Elevation: 1,000 to 2,495 feet (305 to 762 meters)

Mean annual precipitation: 18 to 30 inches (460 to 762 millimeters)

Mean annual air temperature: 57 to 66 degrees F (14 to 19 degrees C)

Frost-free period: 210 to 240 days

Map unit Prime Farmland class: Not prime farmland

Composition

Knoco and similar soils: 35 percent

Vernon and similar soils: 30 percent

Contrasting soils: 35 percent

- Jolly, Owens, and Truce soils

Soil Description

Knoco

Landscape: Breaks

Landforms: Hill slopes

Geomorphic positions, two-dimensional: Backslope, footslope

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Clayey residuum weathered from claystone

Typical Profile

A—0 to 3 inches; moderately alkaline clay

Cd1—3 to 9 inches; moderately alkaline clay

Cd2—9 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 8 to 45 percent

Percent of area covered by surface fragments: About 6 percent subangular boulders, about 3 percent subrounded gravel, about 3 percent subangular stones, about 1 percent subrounded cobbles

Depth to first restrictive layer: 3 to 20 inches (densic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 0.8 inches (Very low)

Natural drainage class: Well drained

Runoff: Very high

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s

Ecological site name: Very Shallow Clay 23-31" PZ

Ecological site number: R078CY114TX

Soil Description

Vernon

Landscape: Breaks

Landforms: Hill slopes

Geomorphic positions, two-dimensional: Backslope, footslope

Geomorphic positions, three-dimensional: Base slope, side slope

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Clayey residuum weathered from mudstone

Typical Profile

A—0 to 3 inches; moderately alkaline clay

Bk—3 to 20 inches; moderately alkaline clay

Cd1—20 to 60 inches; moderately alkaline clay

Cd2—60 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 3 to 30 percent

Percent of area covered by surface fragments: About 6 percent subangular boulders, about 3 percent subrounded gravel, about 3 percent subangular stones, about 1 percent subrounded cobbles

Depth to first restrictive layer: 20 to 40 inches (densic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Sodic

Representative total available water capacity to 60 inches: About 2.5 inches (Very low)

Natural drainage class: Well drained

Runoff: High

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s

Ecological site name: Shallow Clay 23-30" PZ

Ecological site number: R078CY112TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion
- Rock fragments (stoniness) hinders use of mechanical implements
- Restricted rooting zone

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall
- Restricted rooting zone

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall
- Restricted rooting zone

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

LeB—Leeray clay, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies

Elevation: 1,045 to 1,745 feet (320 to 533 meters)

Mean annual precipitation: 25 to 29 inches (635 to 737 millimeters)

Mean annual air temperature: 64 to 66 degrees F (18 to 19 degrees C)

Frost-free period: 210 to 240 days

Map unit Prime Farmland class: All areas are prime farmland

Composition

Leeray and similar soils: 85 percent

Contrasting soils: 15 percent

- Set, Throck, and Thurber soils

Soil Description

Leeray

Landscape: River valleys

Landforms: Remnant terraces, valley floors

Geomorphic positions, two-dimensional: Toeslope

Geomorphic positions, three-dimensional: Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Clayey alluvium

Typical Profile

A1, A2—0 to 20 inches; neutral clay

Bkss1—20 to 42 inches; moderately alkaline clay

Bkss2—42 to 54 inches; moderately alkaline clay

2Bck1, 2Bck2—54 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 1 to 3 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 9.0 inches (High)

Soil Survey of Young County, Texas

Natural drainage class: Well drained

Runoff: Medium

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 2e

Ecological site name: Clayey Upland 26-33" PZ

Ecological site number: R080BY607TX

Use and Management

Major Use: Cropland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion if adequate cover is not present

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

LnA—Lincoln sandy loam, 0 to 1 percent slopes, occasionally flooded

Setting

Major land resource area: MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80A—Central Rolling Red Prairies

Elevation: 895 to 2,000 feet (274 to 610 meters)

Mean annual precipitation: 22 to 28 inches (559 to 711 millimeters)

Mean annual air temperature: 57 to 64 degrees F (14 to 18 degrees C)

Frost-free period: 185 to 225 days

Map unit Prime Farmland class: Not prime farmland

Composition

Lincoln and similar soils: 90 percent

Contrasting soils: 10 percent

- Padgett, Westola, and Wheatwood soils

Soil Description

Lincoln

Landscape: River valleys

Landforms: Natural levees

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Sandy alluvium

Typical Profile

A—0 to 6 inches; moderately alkaline sandy loam

C—6 to 80 inches; moderately alkaline fine sand

Properties and Qualities

Slope: 0 to 1 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 6.0 to 20 in/hr (Rapid)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 3.5 inches (Low)

Natural drainage class: Somewhat excessively drained

Runoff: Negligible

Flooding frequency: Occasional

Interpretive Groups

Land capability nonirrigated: 3s

Land capability irrigated: 3s

Ecological site name: Sandy Bottomland 24-29" PZ

Ecological site number: R080AY614TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Hazard of water and wind erosion
- Low fertility
- Occasional flooding
- Inadequate plant available water

Pastureland Limitations

- Inadequate plant available water

Rangeland Limitations

- Seepage in pond sites
- Inadequate plant available water

Urban Use Limitations

- Seepage limits this for use as septic tank absorption fields
- Not suited to urban use because of occasional (or frequent) flooding

LyB—Lindy silt loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies

Elevation: 750 to 2,250 feet (229 to 686 meters)

Mean annual precipitation: 24 to 34 inches (610 to 864 millimeters)

Mean annual air temperature: 64 to 65 degrees F (18 to 18 degrees C)

Frost-free period: 210 to 260 days

Map unit Prime Farmland class: Prime farmland, if irrigated

Composition

Lindy and similar soils: 85 percent

Contrasting soils: 15 percent

- Lindy, Palopinto, and Rowden soils

Soil Description

Lindy

Landscape: Hills

Landforms: Ridges

Geomorphic positions, two-dimensional: Summit

Across-slope shape: Linear

Parent material: Clayey residuum weathered from limestone

Typical Profile

A—0 to 7 inches; neutral silt loam

Bt1, Bt2, Bt3—7 to 32 inches; neutral and slightly alkaline clay

R—32 to 60 inches; limestone bedrock

Properties and Qualities

Slope: 1 to 3 percent

Depth to first restrictive layer: 20 to 40 inches (lithic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 4.9 inches (Low)

Natural drainage class: Well drained

Runoff: High

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e

Ecological site name: Deep Redland 26-33" PZ

Ecological site number: R080BY148TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Hazard of water erosion
- Restricted rooting zone
- Low soil moisture in periods of inadequate rainfall

Pastureland Limitations

- Restricted rooting zone
- Seepage in pond sites
- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Restricted rooting zone

- Seepage in pond sites
- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling
- Depth to bedrock (hard or soft)

MwB—Minwells fine sandy loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 80B—Texas North-Central Prairies

Elevation: 700 to 1,295 feet (213 to 396 meters)

Mean annual precipitation: 26 to 33 inches (660 to 838 millimeters)

Mean annual air temperature: 64 to 67 degrees F (18 to 19 degrees C)

Frost-free period: 218 to 244 days

Map unit Prime Farmland class: Prime farmland, if irrigated

Composition

Minwells and similar soils: 85 percent

Contrasting soils: 15 percent

- Bastrop, Bluegrove, and Truce soils

Soil Description

Minwells

Landscape: River valleys

Landforms: High stream terraces

Geomorphic positions, three-dimensional: Tread, riser

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Sandy and gravelly alluvium

Typical Profile

A—0 to 9 inches; neutral fine sandy loam

Bt1, Bt2, Bt3—9 to 68 inches; slightly alkaline clay, slightly alkaline sandy clay, and moderately alkaline sandy clay

2C—68 to 80 inches; moderately alkaline very gravelly sand

Properties and Qualities

Slope: 1 to 3 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 8.3 inches (Moderate)

Natural drainage class: Well drained

Runoff: High

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 2e

Ecological site name: Sandy Loam 26-33" PZ

Ecological site number: R080BY159TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion if adequate cover is not present

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

NcB—Newcastle loamy fine sand, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 80B—Texas North-Central Prairies

Elevation: 1,000 to 1,450 feet (305 to 442 meters)

Mean annual precipitation: 26 to 30 inches (660 to 762 millimeters)

Mean annual air temperature: 61 to 65 degrees F (16 to 18 degrees C)

Frost-free period: 220 to 230 days

Map unit Prime Farmland class: All areas are prime farmland

Composition

Newcastle and similar soils: 85 percent

Contrasting soils: 15 percent

- Bluegrove, Bonti, Callahan, and Jolly soils

Soil Description

Newcastle

Landscape: Hills

Landforms: Ridges

Geomorphic positions, two-dimensional: Summit

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Loamy residuum weathered from sandstone

Typical Profile

A—0 to 11 inches; moderately acid loamy fine sand

Bt—11 to 37 inches; neutral sandy clay loam

Cd—37 to 60 inches; bedrock

Properties and Qualities

Slope: 1 to 3 percent

Depth to first restrictive layer: 20 to 40 inches (densic bedrock)

Soil Survey of Young County, Texas

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 4.1 inches (Low)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 4e
Ecological site name: Loamy Sand 26-33" PZ
Ecological site number: R080BY153TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Hazard of water and wind erosion
- Restricted rooting zone
- Low fertility

Pastureland Limitations

- Restricted rooting zone
- Seepage in pond sites

Rangeland Limitations

- Restricted rooting zone
- Seepage in pond sites

Urban Use Limitations

- Depth to bedrock (hard or soft)

NeB—Newcastle fine sandy loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies
Elevation: 1,000 to 1,450 feet (305 to 442 meters)
Mean annual precipitation: 26 to 30 inches (660 to 762 millimeters)
Mean annual air temperature: 61 to 65 degrees F (16 to 18 degrees C)
Frost-free period: 220 to 230 days
Map unit Prime Farmland class: Not prime farmland

Composition

Newcastle and similar soils: 85 percent
Contrasting soils: 15 percent

- Bluegrove, Callahan, and Jolly soils

Soil Description

Newcastle

Landscape: Hills

Landforms: Ridges

Geomorphic positions, two-dimensional: Summit

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Loamy residuum weathered from sandstone

Typical Profile

A—0 to 7 inches; neutral fine sandy loam

Bt1, Bt2—7 to 28 inches; slightly alkaline and moderately alkaline sandy clay loam

Cd1, Cd2—28 to 60 inches; sandstone bedrock

Properties and Qualities

Slope: 1 to 3 percent

Depth to first restrictive layer: 20 to 40 inches (densic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 3.4 inches (Low)

Natural drainage class: Well drained

Runoff: Low

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e

Land capability irrigated: 2e

Ecological site name: Sandy Loam 26-33" PZ

Ecological site number: R080BY159TX

Use and Management

Major Use: rangeland

Cropland Limitations

- Hazard of water erosion
- Restricted rooting zone
- Low soil moisture in periods of inadequate rainfall

Pastureland Limitations

- Restricted rooting zone
- Seepage in pond sites
- Low moisture in periods of inadequate rainfall

Rangeland Limitations

- Restricted rooting zone
- Seepage in pond sites
- Low moisture in periods of inadequate rainfall

Urban Use Limitations

- Depth to bedrock (hard or soft)

NoC—Newcastle-Jolly complex, 1 to 5 percent slopes

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies

Elevation: 1,000 to 1,600 feet (305 to 488 meters)

Mean annual precipitation: 26 to 30 inches (660 to 762 millimeters)

Mean annual air temperature: 61 to 66 degrees F (16 to 19 degrees C)

Frost-free period: 210 to 240 days

Map unit Prime Farmland class: Not prime farmland

Composition

Newcastle and similar soils: 45 percent

Jolly and similar soils: 40 percent

Contrasting soils: 15 percent

- Bluegrove, Callahan, and Exray soils

Soil Description

Newcastle

Landscape: Hills

Landforms: Ridges

Geomorphic positions, two-dimensional: Summit

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Loamy residuum weathered from sandstone

Typical Profile

A—0 to 4 inches; neutral fine sandy loam

Bt—4 to 33 inches; neutral sandy clay loam

Cd—33 to 60 inches; neutral sandstone bedrock

Properties and Qualities

Slope: 1 to 5 percent

Depth to first restrictive layer: 20 to 40 inches (densic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 4.0 inches (Low)

Natural drainage class: Well drained

Runoff: Low

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e

Land capability irrigated: 3e

Ecological site name: Sandy Loam 26-33" PZ

Ecological site number: R080BY159TX

Soil Description

Jolly

Landscape: Hills

Landforms: Low ridges

Geomorphic positions, two-dimensional: Shoulder

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Residuum weathered from sandstone

Typical Profile

A1, A2—0 to 7 inches; slightly acid fine sandy loam

Bt1—7 to 15 inches; neutral sandy clay loam

Bt2—15 to 19 inches; neutral gravelly fine sandy loam

Cr/Bt, Cr—19 to 60 inches; neutral fine sandy loam

Properties and Qualities

Slope: 1 to 5 percent

Depth to first restrictive layer: 12 to 20 inches (paralithic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 2.5 inches (Very low)

Natural drainage class: Well drained

Runoff: Low

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 4e

Ecological site name: Sandstone Hill 26-33" PZ

Ecological site number: R080BY157TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Hazard of water erosion
- Restricted rooting zone

Pastureland Limitations

- Restricted rooting zone
- Seepage in pond sites

Rangeland Limitations

- Restricted rooting zone
- Seepage in pond sites

Urban Use Limitations

- Depth to bedrock (hard or soft)

NuA—Nukrum clay loam, 0 to 1 percent slopes

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie

Elevation: 1,150 to 1,945 feet (351 to 594 meters)

Mean annual precipitation: 25 to 29 inches (635 to 737 millimeters)

Mean annual air temperature: 63 to 67 degrees F (17 to 19 degrees C)

Frost-free period: 220 to 240 days

Map unit Prime Farmland class: All areas are prime farmland

Composition

Nukrum and similar soils: 85 percent

Contrasting soils: 15 percent

- Abilene, Leeray, and Sagerton soils

Soil Description

Nukrum

Landscape: River valleys

Landforms: Remnant paleoterraces

Geomorphic positions, three-dimensional: Riser

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Clayey alluvium

Typical Profile

Ap, A—0 to 13 inches; moderately alkaline clay loam and clay

Bw1, Bw2, Bk1—13 to 51 inches; moderately alkaline clay

Bk2—51 to 80 inches; moderately alkaline silty clay loam

Properties and Qualities

Slope: 0 to 1 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 10.5 inches (High)

Natural drainage class: Well drained

Runoff: Medium

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 2s

Ecological site name: Clay Loam 25-28" PZ

Ecological site number: R078AY119TX

Use and Management

Major Use: Cropland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion if adequate cover is not present

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

**OhG—Owens-Harpersville complex, 8 to 45 percent slopes,
extremely bouldery**

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies

Elevation: 1,000 to 2,345 feet (305 to 716 meters)

Mean annual precipitation: 24 to 30 inches (610 to 762 millimeters)

Mean annual air temperature: 63 to 65 degrees F (17 to 18 degrees C)

Frost-free period: 220 to 230 days

Map unit Prime Farmland class: Not prime farmland

Composition

Owens and similar soils: 59 percent

Harpersville and similar soils: 36 percent

Contrasting soils: 5 percent

- Callahan, Palopinto, and Throck soils

Soil Description

Owens

Landscape: Hills

Landforms: Ridges

Geomorphic positions, two-dimensional: Backslope

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Clayey residuum weathered from claystone

Typical Profile

A—0 to 6 inches; moderately alkaline clay

Bk—6 to 19 inches; moderately alkaline clay

Cd—19 to 60 inches; moderately alkaline clay

Properties and Qualities

Slope: 8 to 40 percent

Percent of area covered by surface fragments: About 2 percent subangular stones, about 8 percent subangular boulders, less than 1 percent subangular cobbles

Depth to first restrictive layer: 14 to 30 inches (densic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.0 to 0.001 in/hr (Almost impermeable)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Soil Survey of Young County, Texas

Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 2.4 inches (Very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Rocky Hill 26-33" PZ
Ecological site number: R080BY156TX

Soil Description

Harpersville

Landscape: Hills
Landforms: Ridges
Geomorphic positions, two-dimensional: Backslope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey residuum weathered from claystone

Typical Profile

A—0 to 8 inches; moderately alkaline clay
Cd—8 to 60 inches; moderately alkaline clay

Properties and Qualities

Slope: 8 to 45 percent
Percent of area covered by surface fragments: About 8 percent subangular boulders, about 2 percent subangular stones, less than 1 percent subangular cobbles
Depth to first restrictive layer: 3 to 14 inches (densic bedrock)
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.0 to 0.001 in/hr (Almost impermeable)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 0.9 inches (Very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Rocky Hill 26-33" PZ
Ecological site number: R080BY156TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion
- Rock fragments (stoniness) hinders use of mechanical implements

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling
- Slope

OnE—Owens clay, 5 to 12 percent slopes, rubbly

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies

Elevation: 1,000 to 2,345 feet (305 to 716 meters)

Mean annual precipitation: 24 to 30 inches (610 to 762 millimeters)

Mean annual air temperature: 63 to 65 degrees F (17 to 18 degrees C)

Frost-free period: 220 to 230 days

Map unit Prime Farmland class: Not prime farmland

Composition

Owens and similar soils: 85 percent

Contrasting soils: 15 percent

- Harpersville, Palopinto, and Throck soils

Soil Description

Owens

Landscape: Hills

Landforms: Ridges, scarp slopes on cuestas

Geomorphic positions, two-dimensional: Backslope

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Clayey residuum weathered from claystone

Typical Profile

A—0 to 4 inches; moderately alkaline clay

Bk—4 to 17 inches; moderately alkaline clay

Cd—17 to 60 inches; moderately alkaline clay

Properties and Qualities

Slope: 5 to 12 percent

Percent of area covered by surface fragments: About 15 percent subangular stones, about 3 percent subangular boulders, about 1 percent subangular cobbles

Depth to first restrictive layer: 14 to 30 inches (densic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.0 to 0.001 in/hr (Almost impermeable)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Soil Survey of Young County, Texas

Representative total available water capacity to 60 inches: About 2.1 inches (Very low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Rocky Hill 26-33" PZ
Ecological site number: R080BY156TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion
- Rock fragments (stoniness) hinders use of mechanical implements

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

Ow—Oil-waste land

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies
Elevation: 1,000 to 1,522 feet (1,000 to 1,522 meters)
Mean annual precipitation: 26 to 32 inches (660 to 813 millimeters)
Mean annual air temperature: 63 to 66 degrees F (17 to 19 degrees C)
Frost-free period: 210 to 240 days
Map unit Prime Farmland class: Not prime farmland

Composition

Oil-Waste Land and similar soils: 100 percent
Contrasting soils: None

Properties and Qualities

Slope: 0 to 8 percent
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 6.0 to 20 in/hr (Rapid)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About (Very low)
Natural drainage class: Well drained
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 8s

PaA—Padgett clay, 0 to 1 percent slopes, occasionally flooded

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies

Elevation: 845 to 1,145 feet (259 to 350 meters)

Mean annual precipitation: 27 to 30 inches (686 to 762 millimeters)

Mean annual air temperature: 60 to 65 degrees F (16 to 18 degrees C)

Frost-free period: 210 to 230 days

Map unit Prime Farmland class: All areas are prime farmland

Composition

Padgett and similar soils: 90 percent

Contrasting soils: 10 percent

- Lincoln, Westola, and Wheatwood soils

Soil Description

Padgett

Landscape: River valleys (fig. 6)

Landforms: Flood plains

Down-slope shape: Linear

Across-slope shape: Concave

Parent material: Clayey alluvium

Typical Profile

A—0 to 9 inches; moderately alkaline clay

Bw, Bkss1, Bkss2, Bkss3—9 to 66 inches; moderately alkaline clay

Bkss4—66 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 0 to 1 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: No restrictive layer

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 8.1 inches (Moderate)

Natural drainage class: Well drained

Runoff: High

Flooding frequency: Occasional

Interpretive Groups

Land capability nonirrigated: 3w

Land capability irrigated: 3w

Ecological site name: Clayey Bottomland 26-33" PZ

Ecological site number: R080BY144TX



Figure 6.—The soils adjacent to the Brazos River are Padgett clay, 0 to 1 percent slopes, occasionally flooded.

Use and Management

Major Use: Cropland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Occasional flooding
- Hazard of water erosion if adequate cover is not present

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling
- Not suited to urban uses because of occasional flooding

PaD—Palopinto stony loam, 1 to 8 percent slopes, rubbly

Setting

Major land resource area: MLRA 80B—Texas North-Central Prairies

Elevation: 1,000 to 2,000 feet (305 to 610 meters)

Mean annual precipitation: 24 to 30 inches (610 to 762 millimeters)

Mean annual air temperature: 63 to 66 degrees F (17 to 19 degrees C)

Frost-free period: 210 to 240 days

Map unit Prime Farmland class: Not prime farmland

Composition

Palopinto and similar soils: 85 percent

Contrasting soils: 15 percent

- Hensley, Lindy, and Set soils

Soil Description

Palopinto

Landscape: Hills

Landforms: Ridges

Geomorphic positions, two-dimensional: Shoulder

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Stony residuum weathered from limestone

Typical Profile

A1—0 to 7 inches; neutral stony loam

A2—7 to 11 inches; neutral extremely stony loam

R—11 to 60 inches; bedrock

Properties and Qualities

Slope: 1 to 8 percent

Percent of area covered by surface fragments: About 20 percent subangular stones, about 10 percent subangular boulders, about 1 percent subangular cobbles

Depth to first restrictive layer: 6 to 20 inches (lithic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 0.9 inches (Very low)

Natural drainage class: Well drained

Runoff: Low

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 6s

Ecological site name: Low Stony Hill 26-33" PZ

Ecological site number: R080BY154TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion
- Rock fragments (stoniness) hinders use of mechanical implements

Pastureland Limitations

- Restricted rooting zone
- Seepage in pond sites

Rangeland Limitations

- Restricted rooting zone
- Seepage in pond sites

Urban Use Limitations

- Depth to bedrock (hard or soft)

QU—Pits, quarry

Setting

Major land resource area: MLRA 80B—Texas North-Central Prairies
Mean annual precipitation: 26 to 32 inches (660 to 813 millimeters)
Mean annual air temperature: 63 to 66 degrees F (17 to 19 degrees C)
Frost-free period: 210 to 240 days
Map unit Prime Farmland class: Not prime farmland

Composition

Pits quarry and similar soils: 100 percent
Contrasting soils: None

Properties and Qualities

Depth to first restrictive layer: Not present
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About (Very low)
Flooding frequency: Not flooded

Interpretive Groups

Land capability nonirrigated: None specified

RwB—Rowden clay loam, 0 to 2 percent slopes

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies
Elevation: 1,150 to 2,145 feet (351 to 655 meters)
Mean annual precipitation: 24 to 28 inches (610 to 711 millimeters)
Mean annual air temperature: 64 to 66 degrees F (18 to 19 degrees C)
Frost-free period: 210 to 240 days
Map unit Prime Farmland class: Prime farmland, if irrigated

Composition

Rowden and similar soils: 85 percent
Contrasting soils: 15 percent

- Lindy, Palopinto, and Set soils

Soil Description

Rowden

Landscape: Hills
Landforms: Ridges
Geomorphic positions, two-dimensional: Summit

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey residuum weathered from limestone

Typical Profile

A—0 to 13 inches; slightly alkaline clay loam
Bt1, Bt2—13 to 35 inches; slightly alkaline and moderately alkaline clay
R—35 to 60 inches; limestone bedrock

Properties and Qualities

Slope: 0 to 2 percent
Depth to first restrictive layer: 20 to 40 inches (lithic bedrock)
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)
Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 5.3 inches (Low)
Natural drainage class: Well drained
Runoff: Low
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Clay Loam 26-33" PZ
Ecological site number: R080BY146TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Hazard of water erosion
- Restricted rooting zone

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall
- Restricted rooting zone

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall
- Restricted rooting zone

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling
- Depth to bedrock (hard or soft)

SaA—Sagerton loam, 0 to 1 percent slopes

Setting

Major land resource area: MLRA 78C—Central Rolling Red Plains, Eastern Part
Elevation: 1,150 to 2,145 feet (351 to 655 meters)

Soil Survey of Young County, Texas

Mean annual precipitation: 21 to 28 inches (533 to 711 millimeters)

Mean annual air temperature: 61 to 66 degrees F (16 to 19 degrees C)

Frost-free period: 210 to 240 days

Map unit Prime Farmland class: All areas are prime farmland

Composition

Sagerton and similar soils: 85 percent

Contrasting soils: 15 percent

- Abilene, Leeray, and Nukrum soils

Soil Description

Sagerton

Landscape: River valleys

Landforms: Remnant paleoterraces

Geomorphic positions, three-dimensional: Riser, rise

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Loamy alluvium

Typical Profile

Ap, A—0 to 13 inches; slightly alkaline loam

Bt, Btk—13 to 34 inches; moderately alkaline clay loam and silty clay loam

Bk1, Bk2, BCK—34 to 80 inches; moderately alkaline silty clay loam and clay loam

Properties and Qualities

Slope: 0 to 1 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 6.8 inches (Moderate)

Natural drainage class: Well drained

Runoff: Negligible

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 2c

Land capability irrigated: 1

Ecological site name: Clay Loam 23-30" PZ

Ecological site number: R078CY096TX

Use and Management

Major Use: Cropland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion if adequate cover is not present

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

SaB—Sagerton loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 78C—Central Rolling Red Plains, Eastern Part

Elevation: 1,150 to 2,145 feet (351 to 655 meters)

Mean annual precipitation: 21 to 28 inches (533 to 711 millimeters)

Mean annual air temperature: 61 to 66 degrees F (16 to 19 degrees C)

Frost-free period: 210 to 240 days

Map unit Prime Farmland class: All areas are prime farmland

Composition

Sagerton and similar soils: 85 percent

Contrasting soils: 15 percent

- Abilene, Leeray, and Nukrum soils

Soil Description

Sagerton

Landscape: River valleys

Landforms: Remnant paleoterraces

Geomorphic positions, three-dimensional: Riser, rise

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium

Typical Profile

A—0 to 9 inches; neutral loam

Bt—9 to 41 inches; slightly alkaline clay loam

Bk—41 to 80 inches; moderately alkaline silty clay loam

Properties and Qualities

Slope: 1 to 3 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 6.9 inches (Moderate)

Natural drainage class: Well drained

Runoff: Very low

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 2e

Land capability irrigated: 2e

Ecological site name: Clay Loam 23-30" PZ

Ecological site number: R078CY096TX

Use and Management

Major Use: Cropland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion if adequate cover is not present

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

ScB—Springcreek loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie

Elevation: 1,200 to 1,745 feet (366 to 533 meters)

Mean annual precipitation: 20 to 30 inches (508 to 762 millimeters)

Mean annual air temperature: 64 to 68 degrees F (18 to 20 degrees C)

Frost-free period: 210 to 230 days

Map unit Prime Farmland class: Not prime farmland

Composition

Springcreek and similar soils: 85 percent

Contrasting soils: 15 percent

- Exray, Loving, and Truce soils

Soil Description

Springcreek

Landscape: Hills

Landforms: Low ridges

Geomorphic positions, two-dimensional: Summit, shoulder

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Gravelly residuum weathered from limestone

Typical Profile

A—0 to 8 inches; moderately alkaline loam

Bk1, Bk2—8 to 24 inches; moderately alkaline loam and gravelly loam

R—24 to 40 inches; limestone bedrock

Properties and Qualities

Slope: 1 to 3 percent

Depth to first restrictive layer: 20 to 40 inches (lithic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)

Soil Survey of Young County, Texas

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 2.8 inches (Very low)

Natural drainage class: Well drained

Runoff: Low

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 4s

Ecological site name: Clay Loam 25-28" PZ

Ecological site number: R078AY119TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Hazard of water erosion
- Restricted rooting zone

Pastureland Limitations

- Restricted rooting zone
- Seepage in pond sites

Rangeland Limitations

- Restricted rooting zone
- Seepage in pond sites

Urban Use Limitations

- Depth to bedrock (hard or soft)

SeB—Set clay loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 80B—Texas North-Central Prairies

Elevation: 1,095 to 1,295 feet (335 to 396 meters)

Mean annual precipitation: 25 to 29 inches (635 to 737 millimeters)

Mean annual air temperature: 64 to 66 degrees F (18 to 19 degrees C)

Frost-free period: 220 to 230 days

Map unit Prime Farmland class: All areas are prime farmland

Composition

Set and similar soils: 85 percent

Contrasting soils: 15 percent

- Palopinto, Rowden, and Throck soils

Soil Description

Set

Landscape: Hills

Landforms: Ridges

Geomorphic positions, two-dimensional: Footslope

Down-slope shape: Convex

Soil Survey of Young County, Texas

Across-slope shape: Linear

Parent material: Clayey residuum weathered from claystone

Typical Profile

A—0 to 13 inches; moderately alkaline clay loam

Bk—13 to 52 inches; moderately alkaline silty clay loam

Cd—52 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 1 to 3 percent

Depth to first restrictive layer: 40 to 60 inches (densic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 7.8 inches (Moderate)

Natural drainage class: Well drained

Runoff: High

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 2e

Ecological site name: Clay Slopes 26-33" PZ

Ecological site number: R080BY604TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low Hazard of water erosion
- Restricted rooting zone
- Hazard of water erosion if adequate cover is not present

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

SpG—Set-Palopinto complex, 8 to 40 percent slopes, extremely stony

Setting

Major land resource area: MLRA 80B—Texas North-Central Prairies

Elevation: 1,000 to 2,000 feet (305 to 610 meters)

Mean annual precipitation: 24 to 30 inches (610 to 762 millimeters)

Mean annual air temperature: 62 to 67 degrees F (17 to 19 degrees C)

Frost-free period: 210 to 240 days

Map unit Prime Farmland class: Not prime farmland

Composition

Set and similar soils: 50 percent

Palopinto and similar soils: 40 percent

Contrasting soils: 10 percent

- Hensley, Owens, and Throck soils

Soil Description

Set

Landscape: Hills

Landforms: Ridges

Geomorphic positions, two-dimensional: Backslope

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Clayey residuum weathered from claystone

Typical Profile

A—0 to 12 inches; moderately alkaline stony clay loam

Bk1, Bk2—12 to 44 inches; moderately alkaline clay

Cd—44 to 60 inches; claystone bedrock

Properties and Qualities

Slope: 8 to 40 percent

Percent of area covered by surface fragments: About 5 percent subangular stones, about 1 percent subangular boulders, less than 1 percent subangular cobbles

Depth to first restrictive layer: 40 to 60 inches (densic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 6.6 inches (Moderate)

Natural drainage class: Well drained

Runoff: High

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s

Ecological site name: Steep Rocky 26-33" PZ

Ecological site number: R080BY163TX

Soil Description

Palopinto

Landscape: Hills

Landforms: Ridges

Geomorphic positions, two-dimensional: Shoulder, backslope

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Stony residuum weathered from limestone

Typical Profile

A1—0 to 4 inches; neutral very stony loam
A2—4 to 13 inches; neutral extremely stony loam
R—13 to 60 inches; bedrock

Properties and Qualities

Slope: 8 to 20 percent
Percent of area covered by surface fragments: About 20 percent subangular stones, about 10 percent subangular boulders, about 1 percent subangular cobbles
Depth to first restrictive layer: 6 to 20 inches (lithic bedrock)
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)
Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 1.0 inches (Very low)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Steep Rocky 26-33" PZ
Ecological site number: R080BY163TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion
- Rock fragments (stoniness) hinders use of mechanical implements

Pastureland Limitations

- Restricted rooting zone
- Seepage in pond sites

Rangeland Limitations

- Restricted rooting zone
- Seepage in pond sites

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling
- Depth to bedrock (hard or soft)
- Slope

**StF—Shatruce gravelly fine sandy loam, 8 to 30 percent slopes,
rubbly**

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; 80B—Texas North-Central Prairies

Elevation: 1,000 to 1,495 feet (305 to 457 meters)

Mean annual precipitation: 26 to 32 inches (660 to 813 millimeters)

Mean annual air temperature: 63 to 66 degrees F (17 to 19 degrees C)

Frost-free period: 220 to 230 days

Map unit Prime Farmland class: Not prime farmland

Composition

Shatruce and similar soils: 85 percent

Contrasting soils: 15 percent

- Exray, Loving, and Truce soils

Soil Description

Shatruce

Landscape: Hills (Fig. 7)

Landforms: Ridges

Geomorphic positions, two-dimensional: Backslope

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Gravelly colluvium over clayey residuum weathered from claystone

Typical Profile

A,E—0 to 9 inches; slightly acid gravelly fine sandy loam

Bt—9 to 26 inches; strongly acid clay

Cd—26 to 60 inches; strongly acid clay

Properties and Qualities

Slope: 8 to 30 percent

Percent of area covered by surface fragments: About 15 percent subangular boulders, less than 1 percent rounded gravel, about 4 percent subangular stones, less than 1 percent subangular cobbles

Depth to first restrictive layer: 20 to 40 inches (densic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 3.7 inches (Low)

Natural drainage class: Well drained

Runoff: Very high

Flooding frequency: None



Figure 7.—An area of Shatruce gravelly fine sandy loam, 8 to 30 percent slopes, rubbly. The large surface fragments help to stabilize the surface from water erosion.

Interpretive Groups

Land capability nonirrigated: 7s

Ecological site name: Sandstone Hill 26-33" PZ

Ecological site number: R080BY157TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion
- Rock fragments (stoniness) hinders use of mechanical implements

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

StG—Shatruce gravelly fine sandy loam, 12 to 50 percent slopes, very rubbly

Setting

Major land resource area: MLRA 80B—Texas North-Central Prairies

Elevation: 1,000 to 1,495 feet (305 to 457 meters)

Soil Survey of Young County, Texas

Mean annual precipitation: 26 to 32 inches (660 to 813 millimeters)
Mean annual air temperature: 63 to 66 degrees F (17 to 19 degrees C)
Frost-free period: 220 to 230 days
Map unit Prime Farmland class: Not prime farmland

Composition

Shatruce and similar soils: 85 percent
Contrasting soils: 15 percent

- Exray, Loving, and Truce soils

Soil Description

Shatruce

Landscape: Hills
Landforms: Ridges
Geomorphic positions, two-dimensional: Backslope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Gravelly colluvium over clayey residuum weathered from claystone

Typical Profile

A, E—0 to 9 inches; neutral gravelly fine sandy loam
Bt1, Bt2, BCt—9 to 34 inches; moderately acid clay
Cd—34 to 60 inches; dense clay

Properties and Qualities

Slope: 12 to 50 percent
Percent of area covered by surface fragments: About 52 percent subangular boulders, less than 1 percent rounded gravel, about 3 percent subangular stones, less than 1 percent subangular cobbles
Depth to first restrictive layer: 20 to 40 inches (densic bedrock)
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)
Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 5.0 inches (Low)
Natural drainage class: Well drained
Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 7s
Ecological site name: Sandstone Hill 26-33" PZ
Ecological site number: R080BY157TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion

- Rock fragments (stoniness) hinders use of mechanical implements

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

ThB—Thurber clay loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; 80B—Texas North-Central Prairies

Elevation: 845 to 1,745 feet (259 to 533 meters)

Mean annual precipitation: 26 to 32 inches (660 to 813 millimeters)

Mean annual air temperature: 63 to 66 degrees F (17 to 19 degrees C)

Frost-free period: 210 to 240 days

Map unit Prime Farmland class: Not prime farmland

Composition

Thurber and similar soils: 85 percent

Contrasting soils: 15 percent

- Bluegrove, Truce, and Weswind soils

Soil Description

Thurber

Landscape: Hills

Landforms: Ridges

Geomorphic positions, two-dimensional: Toeslope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Clayey slope alluvium derived from claystone

Typical Profile

Ap—0 to 8 inches; neutral clay loam

Bt, Btk1, Btk2—8 to 61 inches; moderately alkaline clay

BC—61 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 0 to 2 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 6.8 inches (Moderate)

Natural drainage class: Moderately well drained

Runoff: Very high
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Claypan Prairie 26-33" PZ (fig. 8)
Ecological site number: R080BY147TX

Use and Management

Major Use: Cropland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion if adequate cover is not present
- Poor soil tilth

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling



Figure 8.—An area of Thurber clay loam, 1 to 3 percent slopes in the background. Thurber soils are in the Claypan Prairie ecological site.

TkC—Throck silty clay loam, 1 to 5 percent slopes

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies
Elevation: 1,245 to 2,250 feet (381 to 686 meters)
Mean annual precipitation: 22 to 30 inches (559 to 762 millimeters)
Mean annual air temperature: 63 to 66 degrees F (17 to 19 degrees C)
Frost-free period: 210 to 240 days
Map unit Prime Farmland class: Not prime farmland

Composition

Throck and similar soils: 85 percent
Contrasting soils: 15 percent

- Harpersville, Owens, and Set soils

Soil Description

Throck

Landscape: Hills
Landforms: Ridges
Geomorphic positions, two-dimensional: Footslope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Clayey residuum weathered from claystone

Typical Profile

A—0 to 4 inches; moderately alkaline silty clay loam
Bk1, Bk2—4 to 40 inches; moderately alkaline clay
BCK—40 to 48 inches; moderately alkaline clay
Cd1, Cd2—48 to 80 inches; claystone bedrock

Properties and Qualities

Slope: 1 to 5 percent
Depth to first restrictive layer: 30 to 60 inches (densic bedrock)
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)
Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 7.2 inches (Moderate)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 4e
Ecological site name: Clay Slopes 26-33" PZ
Ecological site number: R080BY604TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

TmB—Tillman clay loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 78C—Central Rolling Red Plains, Eastern Part

Elevation: 1,000 to 2,000 feet (305 to 610 meters)

Mean annual precipitation: 23 to 28 inches (584 to 711 millimeters)

Mean annual air temperature: 57 to 65 degrees F (14 to 18 degrees C)

Frost-free period: 210 to 240 days

Map unit Prime Farmland class: All areas are prime farmland

Composition

Tillman and similar soils: 85 percent

Contrasting soils: 15 percent

- Bluegrove, Deandale, and Kamay soils

Soil Description

Tillman

Landscape: Dissected plains

Landforms: Ridges

Geomorphic positions, two-dimensional: Toeslope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Clayey alluvium

Typical Profile

A—0 to 7 inches; moderately alkaline clay loam

Bt1, Bt2—7 to 22 inches; moderately alkaline clay

Btk1—22 to 36 inches; moderately alkaline clay

Btk2, Btk3—36 to 62 inches; moderately alkaline clay

Bck—62 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 1 to 3 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)

Salinity, representative within 40 inches: Not saline

Soil Survey of Young County, Texas

Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 8.8 inches (Moderate)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e
Land capability irrigated: 2e
Ecological site name: Clay Loam 23-30" PZ
Ecological site number: R078CY096TX

Use and Management

Major Use: Cropland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion if adequate cover is not present

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

TrB—Truce fine sandy loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies
Elevation: 1,000 to 1,800 feet (305 to 549 meters)
Mean annual precipitation: 24 to 32 inches (610 to 813 millimeters)
Mean annual air temperature: 63 to 66 degrees F (17 to 19 degrees C)
Frost-free period: 210 to 240 days
Map unit Prime Farmland class: Not prime farmland

Composition

Truce and similar soils: 85 percent
Contrasting soils: 15 percent

- Callahan, Thurber, and Weswind soils

Soil Description

Truce

Landscape: Hills
Landforms: Ridges
Geomorphic positions, two-dimensional: Footslope
Down-slope shape: Convex
Across-slope shape: Linear

Soil Survey of Young County, Texas

Parent material: Loamy colluvium and/or loamy slope alluvium over clayey residuum weathered from sandstone and shale

Typical Profile

Ap—0 to 5 inches; neutral fine sandy loam
Bt1, Bt2, Bt3, BCt—5 to 56 inches; slightly alkaline clay loam, moderately alkaline clay, and moderately alkaline clay loam
Cd—56 to 80 inches; claystone bedrock

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: 40 to 60 inches (densic bedrock)
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)
Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 6.1 inches (Moderate)
Natural drainage class: Well drained
Runoff: High
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 3e
Ecological site name: Tight Sandy Loam 26-33" PZ
Ecological site number: R080BY164TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion if adequate cover is not present

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

TrC—Truce fine sandy loam, 3 to 5 percent slopes

Setting

Major land resource area: MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Central Texas North-Central Prairies
Elevation: 1,000 to 1,800 feet (305 to 549 meters)
Mean annual precipitation: 24 to 32 inches (610 to 813 millimeters)
Mean annual air temperature: 63 to 66 degrees F (17 to 19 degrees C)

Soil Survey of Young County, Texas

Frost-free period: 210 to 240 days

Map unit Prime Farmland class: Not prime farmland

Composition

Truce and similar soils: 85 percent

Contrasting soils: 15 percent

- Callahan, Thurber, and Weswind soils

Soil Description

Truce

Landscape: Hills

Landforms: Ridges

Geomorphic positions, two-dimensional: Footslope

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Loamy colluvium and/or loamy slope alluvium over clayey residuum weathered from sandstone and shale

Typical Profile

A—0 to 4 inches; slightly acid fine sandy loam

Bt—4 to 44 inches; neutral clay

Cd—44 to 80 inches; slightly alkaline clay

Properties and Qualities

Slope: 3 to 5 percent

Depth to first restrictive layer: 40 to 60 inches (densic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.06 to 0.2 in/hr (Slow)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 4.8 inches (Low)

Natural drainage class: Well drained

Runoff: High

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 4e

Ecological site name: Tight Sandy Loam 26-33" PZ

Ecological site number: R080BY164TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion if adequate cover is not present

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

VeC—Vernon clay, 1 to 5 percent slopes

Setting

Major land resource area: MLRA 78C—Central Rolling Red Plains, Eastern Part

Elevation: 1,000 to 2,495 feet (305 to 762 meters)

Mean annual precipitation: 20 to 30 inches (508 to 762 millimeters)

Mean annual air temperature: 57 to 65 degrees F (14 to 18 degrees C)

Frost-free period: 210 to 240 days

Map unit Prime Farmland class: Not prime farmland

Composition

Vernon and similar soils: 85 percent

Contrasting soils: 15 percent

- Bluegrove, Kamay, and Tillman soils

Soil Description

Vernon

Landscape: Dissected plains

Landforms: Ridges

Geomorphic positions, two-dimensional: Footslope, toeslope

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Clayey residuum weathered from claystone

Typical Profile

A—0 to 6 inches; moderately alkaline clay

Bk—6 to 28 inches; moderately alkaline clay

Cd—28 to 60 inches; claystone bedrock

Properties and Qualities

Slope: 1 to 5 percent

Depth to first restrictive layer: 20 to 40 inches (densic bedrock)

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Slowest permeability to 60 inches, within and below first cemented restrictive layer: 0.001 to 0.06 in/hr (Very slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Sodic

Sodicity, maximum within 40 inches: Sodic

Representative total available water capacity to 60 inches: About 3.7 inches (Low)

Natural drainage class: Well drained

Runoff: Very high

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 4e
Land capability irrigated: 4e
Ecological site name: Shallow Clay 23-30" PZ
Ecological site number: R078CY112TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Hazard of water erosion
- Restricted rooting zone
- Sodium content is a concern during high rainfall years

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

W—Water

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies
Mean annual precipitation: 26 to 32 inches (660 to 813 millimeters)
Mean annual air temperature: 63 to 66 degrees F (17 to 19 degrees C)
Frost-free period: 210 to 240 days
Map unit Prime Farmland class: Not prime farmland

Composition

Water and similar soils: 100 percent
Contrasting soils: None

Properties and Qualities

Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic

Interpretive Groups

Land capability nonirrigated: None specified

WaA—Westola fine sandy loam, 0 to 1 percent slopes, occasionally flooded

Setting

Major land resource area: MLRA 78C—Central Rolling Red Plains, Eastern Part
Elevation: 1,000 to 2,295 feet (305 to 701 meters)

Soil Survey of Young County, Texas

Mean annual precipitation: 22 to 32 inches (559 to 813 millimeters)
Mean annual air temperature: 57 to 64 degrees F (14 to 18 degrees C)
Frost-free period: 185 to 230 days
Map unit Prime Farmland class: Prime farmland, if irrigated

Composition

Westola and similar soils: 90 percent
Contrasting soils: 10 percent

- Lincoln, Padgett, and Wheatwood soils

Soil Description

Westola

Landscape: Dissected plains
Landforms: Flood plain steps on river valleys
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed loamy alluvium

Typical Profile

A1, A2—0 to 8 inches; moderately alkaline fine sandy loam and silt loam
C1—8 to 21 inches; moderately alkaline very fine sandy loam
C2, C3—21 to 55 inches; moderately alkaline fine sandy loam
C4—55 to 80 inches; moderately alkaline fine sandy loam

Properties and Qualities

Slope: 0 to 1 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 2.0 to 6.0 in/hr (Moderately rapid)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 8.6 inches (Moderate)
Natural drainage class: Well drained
Runoff: Negligible
Flooding frequency: Occasional

Interpretive Groups

Land capability nonirrigated: 2w
Ecological site name: Loamy Bottomland 23-31" PZ
Ecological site number: R078CY103TX

Use and Management

Major Use: Cropland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Occasional flooding
- Hazard of water erosion if adequate cover is not present

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Seepage limits this soil for use as septic tank absorption fields
- Not suited to urban uses because of occasional flooding

WdB—Weswind fine sandy loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies

Elevation: 895 to 1,400 feet (274 to 427 meters)

Mean annual precipitation: 26 to 31 inches (660 to 800 millimeters)

Mean annual air temperature: 64 to 65 degrees F (18 to 18 degrees C)

Frost-free period: 210 to 230 days

Map unit Prime Farmland class: Prime farmland, if irrigated

Composition

Weswind and similar soils: 85 percent

Contrasting soils: 15 percent

- Callahan, Thurber, and Truce soils

Soil Description

Weswind

Landscape: Hills

Landforms: Ridges

Geomorphic positions, two-dimensional: Footslope

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Loamy colluvium over clayey residuum weathered from sandstone and shale

Typical Profile

A1, A2—0 to 11 inches; slightly acid fine sandy loam

Bt1, Bt2—11 to 25 inches; slightly acid and neutral clay

Bt 3, Bt4, Bt5—25 to 67 inches; slightly alkaline clay

BCt—67 to 80 inches; moderately alkaline clay

Properties and Qualities

Slope: 1 to 3 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 9.1 inches (High)

Natural drainage class: Moderately well drained

Runoff: Very low

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 2e

Ecological site name: Tight Sandy Loam 26-33" PZ

Ecological site number: R080BY164TX

Use and Management

Major Use: Rangeland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion if adequate cover is not present

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

WeA—Wheatwood loam, 0 to 1 percent slopes, occasionally flooded

Setting

Major land resource area: MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Central Texas North-Central Prairies

Elevation: 895 to 1,945 feet (274 to 594 meters)

Mean annual precipitation: 22 to 28 inches (559 to 711 millimeters)

Mean annual air temperature: 59 to 65 degrees F (15 to 18 degrees C)

Frost-free period: 210 to 240 days

Map unit Prime Farmland class: All areas are prime farmland

Composition

Wheatwood and similar soils: 90 percent

Contrasting soils: 10 percent

- Clearfork, Lincoln, and Westola soils

Soil Description

Wheatwood

Landscape: River valleys

Landforms: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Mixed loamy alluvium

Typical Profile

Ap, Bw—0 to 14 inches; moderately alkaline loam

Ab, Bk1, Bk2—14 to 51 inches; moderately alkaline and strongly alkaline clay loam

Bk3, Bk4—51 to 80 inches; moderately alkaline loam and strongly alkaline very fine sandy loam

Properties and Qualities

Slope: 0 to 1 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.6 to 2.0 in/hr (Moderate)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 11.2 inches (High)

Natural drainage class: Well drained

Runoff: Negligible

Flooding frequency: Occasional

Interpretive Groups

Land capability nonirrigated: 2w

Ecological site name: Loamy Bottomland 26-33" PZ

Ecological site number: R080BY151TX

Use and Management

Major Use: Cropland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion if adequate cover is not present
- Occasional flooding

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Not suited to urban uses because of occasional flooding

WhB—Wichita clay loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 78C—Central Rolling Red Plains, Eastern Part

Elevation: 1,095 to 2,095 feet (335 to 640 meters)

Mean annual precipitation: 22 to 32 inches (559 to 813 millimeters)

Mean annual air temperature: 61 to 64 degrees F (16 to 18 degrees C)

Frost-free period: 210 to 240 days

Map unit Prime Farmland class: All areas are prime farmland

Composition

Wichita and similar soils: 90 percent

Contrasting soils: 10 percent

- Grandfield, Sagerton, and Winters soils

Soil Description

Wichita

Landscape: Alluvial plain remnants

Landforms: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical Profile

A—0 to 5 inches; neutral clay loam
Bt—5 to 21 inches; neutral clay loam
Btk1, Btk2, BCK—21 to 80 inches; moderately alkaline clay loam

Properties and Qualities

Slope: 1 to 3 percent
Depth to first restrictive layer: Not present
Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)
Salinity, representative within 40 inches: Not saline
Salinity, maximum within 40 inches: Not saline
Sodicity, representative within 40 inches: Not sodic
Sodicity, maximum within 40 inches: Not sodic
Representative total available water capacity to 60 inches: About 9.6 inches (High)
Natural drainage class: Well drained
Runoff: Medium
Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 2e
Land capability irrigated: 2e
Ecological site name: Clay Loam 23-30" PZ
Ecological site number: R078CY096TX

Use and Management

Major Use: Cropland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion if adequate cover is not present

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

WtB—Winters loam, 1 to 3 percent slopes

Setting

Major land resource area: MLRA 78A—Rolling Limestone Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; MLRA 80B—Texas North-Central Prairies
Elevation: 895 to 2,095 feet (274 to 640 meters)
Mean annual precipitation: 20 to 30 inches (508 to 762 millimeters)
Mean annual air temperature: 63 to 68 degrees F (17 to 20 degrees C)

Soil Survey of Young County, Texas

Frost-free period: 210 to 240 days

Map unit Prime Farmland class: All areas are prime farmland

Composition

Winters and similar soils: 85 percent

Contrasting soils: 15 percent

- Deandale, Enterprise, and Grandfield soils

Soil Description

Winters

Landscape: Alluvial plain remnants

Landforms: Plains

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Mixed loamy alluvium

Typical Profile

A—0 to 10 inches; neutral loam

Bt1, Bt2, Bt3—10 to 50 inches; slightly alkaline clay loam

Btk—50 to 80 inches; moderately alkaline clay loam

Properties and Qualities

Slope: 1 to 3 percent

Depth to first restrictive layer: Not present

Slowest soil permeability to 60 inches, above first cemented restrictive layer: 0.2 to 0.6 in/hr (Moderately slow)

Salinity, representative within 40 inches: Not saline

Salinity, maximum within 40 inches: Not saline

Sodicity, representative within 40 inches: Not sodic

Sodicity, maximum within 40 inches: Not sodic

Representative total available water capacity to 60 inches: About 9.7 inches (High)

Natural drainage class: Well drained

Runoff: Medium

Flooding frequency: None

Interpretive Groups

Land capability nonirrigated: 2e

Ecological site name: Sandy Loam 26-33" PZ

Ecological site number: R080BY159TX

Use and Management

Major Use: Cropland

Cropland Limitations

- Low soil moisture in periods of inadequate rainfall
- Hazard of water erosion if adequate cover is not present

Pastureland Limitations

- Low soil moisture in periods of inadequate rainfall

Rangeland Limitations

- Low soil moisture in periods of inadequate rainfall

Urban Use Limitations

- Slow water movement within the soil
- Potential for shrinking and swelling

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 5 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 155,309 acres in the survey area, or nearly 27 percent of the total acreage, meets the soil requirements for prime farmland. Scattered areas of this land are throughout the county, but most are in the northern part, mainly in the Granfield-Gowen, Tillman-Vernon, and the Sagerton map units which are described under the heading "General Soil Map Units." About 100,000 acres of this prime farmland is used for crops. The crops grown on this land, mainly wheat and cotton, account for an estimated two-thirds of the county's total agricultural income each year. About 70,000 acres, or nearly 12 percent of the survey area, would meet the requirements for prime farmland if an adequate and dependable supply of irrigation water were available.

A recent trend in land uses in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. In addition, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for rangeland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both descriptive and numerical.

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are *not limited*, *somewhat limited*, and *very limited*. The suitability ratings are expressed as *well suited*, *moderately suited*, *poorly suited*, and *unsuited* or as *good*, *fair*, and *poor*.

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Crops and Pasture

Prepared by Bobby Hanna, Agronomist, Natural Resources Conservation Service, Weatherford, Texas

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed, the system of land capability classification used by the Natural Resources Conservation Service is explained, and prime farmland is described.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Texas AgriLife Extension Service.

Young County has about 126,940 acres of cropland that makes up about 22 percent of the county. The main crops are wheat, cotton, and forage sorghum. Oats, barley, rye, vetch, grain sorghum, alfalfa, pecans, melons, and millet are also grown. Grass and legume seed are sometimes produced from kleingrass, switchgrass, introduced bluestems, vetch, and alfalfa.

Field crops suited to the soils and climate of the survey area include some that are not commonly grown; gaura, corn, sunflowers, castor beans, mung beans, and similar crops can be grown if economic conditions are favorable.

The very deep, loamy well drained Bastrop, Enterprise, Grandfield, and Grandmore soils are especially suited to growing truck crops where slopes are less than 3 percent. These soils are also suited to growing small and large fruits, nuts, vineyard, and nursery plants. Production is limited mainly by the amount of rainfall or the availability of irrigation water.

The very deep, loamy soils on flood plains are usually well suited to growing truck, nuts, and horticultural crops. In certain areas, the danger of flooding and the concentration of cold air are major concerns.

The potential of the soils in Young County for increased production of food and fiber is good. More than 50,000 acres of soils that have good potential for cropland are currently used as rangeland. In addition to the reserve production capacity represented by this acreage, food and fiber production could be increased considerably by applying the latest crop production technology to all of the cropland in the county. Information provided in this soil survey can greatly facilitate the application of such technology.

Conversion of marginal cropland and some rangeland to pastureland and hayland is a trend that has continued in Young County during the past several years. Land that is used for pasture and hay production is usually planted to introduced grasses that respond well to proper management. The pastures are used mainly to provide yearlong grazing in combination with native rangeland. Erosion is not a problem on these land uses, when managed properly.

The most important grasses, both native and introduced, are improved species of bermudagrass, kleingrass, switchgrass, indiagrass, and several varieties of old world bluestems. An interest is also being shown in seeding Jose tall wheatgrass and other improved varieties of cool season grasses on sites where they are adapted.

Improved bermudagrass, switchgrass, and kleingrass are better suited to deep soils on bottomlands, such as Clearfork, Gowen, Westola, and Wheatwood, than to other soils in the county. However, these grasses are adapted to most of the soils where a good seedbed can be prepared. If soils such as Bluegrove, Bonti, and Callahan are eroded, management problems with bermudagrass, switchgrass, and kleingrass may develop because of the droughty nature of these soils. Drought resistant grasses, such as certain species of old world bluestem, are better adapted to these soils as well as other droughty soils such as Throck, Thurber, and Vernon.

Good management practices for pastureland include nutrient management, prescribed grazing, pest management, brush management, and an adequate water

supply. Good management practices for hayland includes nutrient management, pest management, and forage harvest management.

Erosion Control

Water erosion is a major concern in nearly all of the large areas of cropland and on smaller cropland fields that have a slope of more than 1 percent. It reduces productivity, especially when the surface layer is so thin that it is mixed with the less fertile subsoil during cultivation. The subsoil is low in organic matter and in some places, it contains undesirable salts. When mixed with topsoil, it causes a dense crust to form on the surface. This reduces the ability of air and moisture to enter the soil and hinders the emergence of crop seedlings.

Erosion is especially damaging on soils such as Bluegrove, Bonti, and Lindy that are moderately deep to bedrock. As erosion reduces the thickness of these soils, the rooting zone becomes more restricted and their ability to store moisture for plant use is reduced.

Soil loss by water erosion results in sedimentation of streams, ponds, and lakes. Control of erosion minimizes sedimentation and improves the quality of water for municipal use, recreation, and for fish and wildlife.

Cropping systems should be designed so that they hold soil losses by erosion to a minimal amount in order that productive capacity will be maintained indefinitely. Farming practices that help to control water erosion are those that provide a protective surface cover, reduce the amount and rate of runoff, and increase the rate of water infiltration.

The management of crop residues is the best method of protecting the soil surface and will also help to reduce runoff. Reduced tillage systems that leave a maximum amount of crop residue on the surface will provide the protective cover needed. Delaying seedbed preparation for as long as possible will extend the length of time that residue is on the surface. Protecting residue from grazing and burning is necessary for maximum effectiveness.

Terraces and diversions help control erosion by reducing the length of slope which slows runoff. They also serve as guidelines for contour farming. Nearly all of the farmed soils in Young County are suitable for terraces. Terraces and contour farming increase the rate of water infiltration, thereby increasing crop yields when moisture is limited. Establishing protective grassed waterways to remove excess runoff from terraces and diversions is essential to preventing the formation of gullies.

Wind erosion is a hazard on the sandy Bastrop, Chaney, Devol, Grandfield, and Newcastle soils during periods of drought and during windstorms that occur during the critical wind erosion period of November 1 to June 1.

Some crops such as cotton do not produce adequate residues to protect these soils from blowing during the critical wind erosion period. Rotation of cotton with wheat and sorghum will increase the amount of residue that can be left on the soil surface. Soils left bare and smooth can be damaged in a few hours if winds are strong. Maintaining a vegetative cover or keeping a bare surface rough with tillage are other methods of reducing erosion by wind. Cover crops commonly used during the cool season includes small grain such as wheat, rye, oats, and legumes such as Austrian winter peas and vetch. The legumes protect the soil from wind and water erosion, provide high quality grazing, and add nitrogen to the soil.

More specific information on erosion control practices that can be used on each kind of soil can be obtained at the local office of the Natural Resources Conservation Service or the Texas AgriLife Extension Service.

Soil Fertility and Tilth

Fertility is naturally high in most flood plain soils such as Clearfork, Gowen, and Wheatwood soils. Many of the dark colored soils on uplands such as Abilene, Deandale, Leeray, and Sagerton soils are also high in natural fertility. The light colored fine sandy loam soils on uplands are medium in natural fertility. These include such soils as

Bluegrove, Grandfield, Kamay, and Winters. Most of the soils in the county will benefit from the addition of nitrogen, phosphorous, and potassium. Many areas of the Bonti soils are low in calcium and may benefit from the addition of lime. On all soils, the amount and type of fertilizer application should be based on the results of soil tests, the crop, the expected level of production, the previous land use or cropping sequence, and the amount of available soil moisture. The local office of the Natural Resources Conservation Service or the Texas AgriLife Extension Service can furnish the latest information on the kinds and amounts of fertilizer to apply and provide assistance in obtaining a soil test.

Soil tilth is an important factor in the germination of seeds and in the infiltration of moisture into the soil. Soils with good tilth are granular, porous, and friable. Tilth can be improved by the addition of large amounts of organic matter, leaving crop residues on or near the soil surface, and reducing the number of tillage operations. Fine textured soils such as Leeray, Padgett, Throck, and Tillman tend to have moderate amounts of organic matter and good structure. However, these soils tend to be cloddy if plowed when it is too wet or too dry. Good seedbeds are difficult to prepare in cloddy field conditions. Plowing when it is too wet may cause a plow pan to form and grazing during wet conditions severely damages the soil structure and causes a dense crust to form. Both of these conditions impede the downward movement of plant roots, air, and moisture which causes runoff to increase. Fall plowing results in good tilth for the spring, but wind and water erosion will usually occur if the soil is left bare of vegetation.

Soils that have a light colored surface layer of fine sandy loam, loam, or silt loam generally have a low content of organic matter. Some of these soils may have a clayey subsoil that contains concentrations of undesirable salts in or near the surface layer. Generally the structure of these soils is poor and they tend to form a thick surface crust after an intense rainfall. Once the crust forms, it reduces infiltration and increases runoff. Emerging plant seedlings are often unable to penetrate the thick crust. Regular additions of crop residue, manure, and other organic material such as cotton burs and growing legumes can improve soil structure, soil tilth, and reduce crust formation. Where salts are near the surface, the depth of tillage should be limited so harmful salts will not be concentrated within the plow layer.

Soil Moisture

Inadequate soil moisture is the most limiting factor for crop production in Young County. Although average yearly rainfall is generally adequate for most crops, short periods of drought are common during the growing season. In some years droughts last more than 3 months. The most severe conditions usually occur during the period of middle June to early July when dry, hot air from the desert southwest replaces the humid airflow from the south and southeast. As temperatures reach or exceed 100 degrees Fahrenheit, crops begin to wilt. This problem is more severe in soils such as Deandale, Kamay, Thurber, Tillman, Weswind, and Winters. Although these soils are very deep and have a high available water holding capacity, they also have clayey subsoil with poor structure. This restricts the movement of water to the roots and makes it difficult for roots to penetrate the soil. Crops are unable to obtain all of their water requirements under these conditions. Some of these soils have a high salt content that further reduces moisture availability to the plants.

Other climate factors that may limit crop production are flooding, high winds, occasional hailstorms, and high intensity rains.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of map units in the survey area also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good-quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in Table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or Texas AgriLife Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes. Capability classes are listed for each map unit in the section "Detailed Soil Map Units."

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit (USDA-SCS, 1961).

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, 2*e*. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1, there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, 2*e*-4 and 3*e*-6. These units are not given in all soil surveys.

Pasture and Hayland Groups

The soils of Young County are placed in thirteen pasture and hayland groups according to their suitability for forage production. The soils in each group are enough alike to be suited to the same grasses, to have similar limitations and hazard, to require similar management, and to have similar productivity and other responses to management. The pasture and hayland group is a convenient grouping of soils from which many statements can be made about their management. The pasture and hayland groups are identified by numerals and uppercase letters; for example 1A. The numbers are part of a statewide system. They are not consecutive, because not all groups in the system are represented by the soils of Young County.

Pasture and Hayland Group 1a—Heavy Clayey Bottomland

Only the Padgett soil is in this group. It is well to somewhat poorly drained and slowly or very slowly permeable. It cracks and takes water rapidly when dry but expands and absorbs water slowly or very slowly when wet. Soil reaction is slightly alkaline or moderately alkaline. It is found on nearly level to gently sloping flood plains. Grass establishment is difficult because of the seasonal wetness and dryness of the soils. The best-adapted pasture grasses are bermudagrass, kleingrass, and yellow bluestem. Nutrient management, pest management, brush management, and prescribed grazing are needed for a high level of production.

Pasture and Hayland Group 1c—Friable Clayey Bottomland

The soils in this group are Clearfork and Gageby. These soils are very deep, clayey bottomlands that are friable when moist. They are somewhat sticky when wet and may flood occasionally. The soils have a high natural fertility with very high to high water holding capacity. They also have a good plant soil moisture relationship and high production potential. The best adapted pasture grasses are bermudagrass, big bluestem, indiagrass, kleingrass, yellow bluestem, eastern gammagrass, switchgrass, and Jose tall wheatgrass. Nutrient management, pest management, brush management, and prescribed grazing are needed for a high level of production.

Pasture and Hayland Group 2a—Loamy Bottomland

The soils in this group are Gowen, Westola, and Wheatwood. These are deep, well drained flood plain soils, with loamy surfaces that are mainly moderately permeable. The plant-soil-moisture relationship is good and stored soil moisture is readily available for plant use. Soils in this group are of medium natural fertility. The best adapted pasture grasses are bermudagrass, big bluestem, indiangrass, kleingrass, yellow bluestem, eastern gammagrass, switchgrass, and Jose tall wheatgrass. Nutrient management, pest management, brush management, and prescribed grazing are needed for a high level of production.

Pasture and Hayland Group 3a—Sandy Bottomland

Only the Lincoln soil is in this group. This is a bottomland soil of deep sand with coarse sandy surfaces, nearly level and moderately alkaline. The soil takes water at a rapid rate but the available water holding capacity is low. It has a very good plant-soil-moisture relationship. Overflows normally provide additional moisture. Fertility is usually low. Grass establishment may be adversely affected by loose seedbeds, blowing sand, crusting, and competition from weeds such as grassburs. The best-adapted pasture grasses are bermudagrass, big bluestem, indiangrass, and switchgrass. Nutrient management, pest management, brush management, and prescribed grazing are needed for a high level of production.

Pasture and Hayland Group 7a1—Heavy Clayey Upland (Non-Calcareous)

Only the Tillman soil is in this group. This soil is deep or very deep heavy clayey uplands with slopes of 0 to 5 percent. The subsoils are dense and clayey. The reaction is slightly acid to moderately alkaline in the surface and slightly alkaline or moderately alkaline in the lower layers. The soil has high natural fertility and is seasonally wet or droughty. It also has a very high or high water holding capacity, fair plant to soil moisture relationship, and has a medium to high production potential. Nutrient management, pest management, brush management, and prescribed grazing are needed for a high level of production.

Pasture and Hayland Group 7a2—Heavy Clayey Upland (Calcareous)

The soils in this group are Leeray, Nukrum, and Vernon. These soils are well drained to somewhat poorly drained and slowly to very slowly permeable. They crack and take water rapidly when dry but expand and absorb water very slowly when wet. They have a high water holding capacity, but have fair to poor plant-soil-moisture relationship. They are seasonally wet or seasonally droughty. Seedbed preparation is somewhat difficult because of the clayey texture. Nutrient management, pest management, brush management, and prescribed grazing are needed for a high level of production.

Pasture and Hayland Group 7c—Friable Clayey Upland

The soils in this group are Abilene, Bluegrove, Lindy, Rowden, Sagerton, Set, and Springcreek. They are friable when moist and somewhat sticky when wet and have moderately dense but friable subsoils. Moisture is absorbed at a moderate rate. They have a fair to good plant-soil-moisture relationship. The best-adapted pasture grasses are bermudagrass, yellow bluestem, indiangrass, kleingrass, Wilman lovegrass, and switchgrass. Nutrient management, pest management, brush management, and prescribed grazing are needed for a high level of production.

Pasture and Hayland Group 7h—Tight Clayey Upland

The soils in this group are Callahan and Thurber. These soils have very dense clay subsoil that cracks when dry. Water is absorbed very slowly because of surface sealing and the tightness of the subsoil. The water holding capacity is moderate to high and the plant-soil-moisture relationship is poor. These are droughty soils when they are dry. Seedbed preparation is difficult because of the clayey texture. The best-adapted pasture grasses are yellow bluestem, kleingrass, and Wilman lovegrass. Nutrient management, pest management, brush management, and prescribed grazing are needed for a high level of production.

Pasture and Hayland Group 8a—Tight Loamy Upland

The soils in this group are Bonti, Deandale, Kamay, Weswind, and Winters. These are upland soils with loamy surfaces that are moderately acid to neutral. The soil slope ranges from nearly level to moderately sloping. The soils have loamy surfaces that take water well but the dense clayey subsoils restrict water infiltration. These soils are seasonally wet or seasonally droughty and are considered to have a fair to poor plant-soil-moisture relationship. This group is usually low in fertility. The production potential is medium to high. The best-adapted pasture grasses are bermudagrass, yellow bluestem, indiagrass, and Wilman lovegrass. Nutrient management, pest management, brush management, and prescribed grazing are needed for a high level of production.

Pasture and Hayland Group 8c—Loamy Upland

The soils in this group are Anocon, Bastrop, Enterprise, Grandfield, Grandmore, Minwells, and Newcastle. These are loamy upland soils that are moderately fertile and have friable subsoils that take up moisture moderately or moderately rapid. They hold medium to high amounts of moisture and have a fair to good plant-soil-moisture relationship. They are well drained. Quick surface drying, soil blowing, and some crusting are hazards to establishment of grass. The production potential is medium to high. The best-adapted pasture grasses are bermudagrass, yellow bluestem, big bluestem, indiagrass, eastern gammagrass, kleingrass, Wilman lovegrass, and switchgrass. Nutrient management, pest management, brush management, and prescribed grazing are needed for a high level of production.

Pasture and Hayland Group 9a—Sandy Upland

The soils in this group are Bastrop, Chaney, Decordova, Goodnight, Grandfield, Heaton, and Newcastle. These are coarse sandy upland soils with a coarse sandy surface up to 40 inches thick, nearly level or gently sloping. They are generally well drained. The intake of moisture is rapid in the upper portion of the profile but moves moderately to slowly in the subsoil. These soils hold only a medium to low amount of moisture but what is held is readily available for plant growth. Fertility is usually low. Establishing grass by seeding on a clean seedbed may be hazardous because of the cutting action of blowing sand. Seedbeds present a problem because of the difficulty of obtaining firmness for planting. The best-adapted pasture grasses are bermudagrass, indiagrass, weeping lovegrass, and switchgrass. Nutrient management, pest management, brush management, and prescribed grazing are needed for a high level of production.

Pasture and Hayland Group 13a—Shallow Clayey

Only the Hensley soil is in this group. This is a clayey to moderately clayey shallow soil that is nearly level or gently sloping. It absorbs moisture at a slow to moderately slow rate. It is 20 inches or less in depth. It has medium natural fertility; droughty; low water-holding capacity with poor plant-soil-moisture relationship. This soil is not well suited to

pastureland. The best-adapted pasture grasses are bermudagrass, yellow bluestem, kleingrass, and Wilman lovegrass. Nutrient management, pest management, brush management, and prescribed grazing are needed for a high level of production.

Pasture and Hayland Group 14a—Shallow Loamy

The soils in this group are Jacksboro and the Newcastle-Jolly complex. They are shallow loamy uplands less than 20 inches thick. They have low natural fertility, are droughty, and have low water holding capacity with poor plant to soil moisture relationship. The production potential is low. The best-adapted pasture grasses are bermudagrass, yellow bluestem, indiagrass, and Wilman lovegrass. Nutrient management, pest management, brush management, and prescribed grazing are needed for a high level of production.

There are several soils located in Young County that are not suited to pasture or hayland because of one or a combination of the following: gravelly, large stones, slopes, depth, or low water holding capacity.

Rangeland

Prepared by Reggie Quiett, Rangeland Management Specialist, Natural Resources Conservation Service, Vernon, Texas

About 56 percent of Young County is rangeland. Cow-calf is the dominate livestock operation with some stocker operations. Most of the stocker operations are run in conjunction with wheat pastures. The average size of an operating unit is about 595 acres.

The native vegetation in much of the county has been greatly depleted by continued excessive use and elimination by fire. Much of the acreage that was once open grassland is now covered with brush and weeds. Mesquite has invaded the entire county and uses gallons of water inefficiently that could be used by more desirable plant species. Juniper is now creeping in on the hills in the southern portion of the county and may create additional problems. Post oak and blackjack oak, better woody species; at times create problems because of their thick densities and understory of greenbrier. The amount of grass forage produced may be less than half of that originally produced. Productivity of the range can be increased by using management practices that are effective for specific kinds of soils and range sites.

Many livestock operations supplement grazing of rangeland with improved pasture and forage crops. Bermudagrass, kleingrass, and yellow bluestem often compliment native grasses. Small grain and forage sorghum provide extra grazing.

The major management concern on most of the rangeland is control of grazing so that the kinds and amount of plants that make up the potential or climax plant community are reestablished. Controlling brush is an important management concern. If sound range management based on soil survey information and rangeland inventories is applied, the potential is good for increasing the productivity of range in the area.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

Table 7 shows, for each soil that supports rangeland vegetation, the ecological site and the potential annual production of vegetation in favorable, normal, and unfavorable years. An explanation of the column headings in the table follows.

An *ecological site* is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the soil development process; a characteristic hydrology, particularly infiltration and runoff that has developed over time; and a characteristic plant community (kind and amount of vegetation). The hydrology of a site is influenced by development of the soil and plant

community. The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production.

Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service.

Total dry-weight production is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a common percent of air-dry moisture content.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range similarity index and rangeland trend. Range similarity index is determined by comparing the present plant community with the potential natural plant community on a particular rangeland ecological site. The more closely the existing community resembles the potential community, the higher the range similarity index. Rangeland trend is defined as the direction of change in an existing plant community relative to the potential natural plant community. Further information about the range similarity index and rangeland trend is available in chapter 4 of the "National Range and Pasture Handbook" at <http://www.glti.nrcs.usda.gov>, or in the local office of the Natural Resources Conservation Service.

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, an area with a range similarity index somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Ecological Sites

There are twenty-one ecological sites in Young County. Following are the descriptions of each.

Loamy Bottomland Ecological Site. The Clearfork, Gowen, Wheatwood, and Westola soils are in this site. The climax plant community is a tall and mid grass site which supports an abundance of forbs and woody plants. The composition by weight is about 75 percent grasses, 10 percent forbs, and 15 percent woody plants.

The climax vegetation consists of about 40 percent indiangrass, switchgrass, big bluestem and little bluestem; 15 percent vine mesquite and sideoats grama; 20 percent Canada wildrye, Texas wintergrass, western wheatgrass, and Texas bluegrass and trace amounts of dropseed, plains lovegrass, plains bristleggrass, Arizona cottontop, silver bluestem, buffalograss, and white tridens. The 10 percent forb composition consists of Englemann-daisy, Maximilian sunflower, heath aster, gaura, bundleflower, sagewort, verbena, sensitivebriar, ragweed, and greenthread. The 15 percent woody plant composition consists of cottonwood, elm, hackberry, oak, pecan, bumelia, western soapberry, redbud, plum, and greenbriar. The approximate total annual air-dry herbage yield in climax condition ranges from 4,000 to 8,000 pounds per acre depending upon rainfall.

If regression occurs as a result of heavy grazing, the tall grasses are replaced by sideoats grama, vine mesquite, Texas wintergrass, and western wheatgrass initially. Continued heavy grazing and lack of periodic fire results in a plant community dominated by Texas wintergrass, western wheatgrass, threeawn, many annual grasses and forbs, and a great increase in woody plants.

Loamy Prairie Ecological Site. The Anocon soil is in this site. The climax plant community is an open tall and mid grass prairie. The composition by weight is about 95 percent grasses, 5 percent forbs, and only a trace of woody plants.

The climax vegetation consists of about 25 percent big bluestem, indiagrass, and switchgrass; 25 percent little bluestem; 10 percent vine mesquite, sideoats grama, and Arizona cottontop; 15 percent buffalograss, dropseeds, blue grama, and threeawn; and 10 percent Texas wintergrass, western wheatgrass, and Canada wildrye. The 5 percent forb composition consists of Englemann-daisy, heath aster, sagewort, ragweed, gaura, bundleflower, trailing ratany, mentzelia, scurfpea, and wooly white. Woody plants that occasionally occur in the landscape include hackberry, elbowbush, daleas, bumelia, and skunkbush. The approximate total annual air-dry herbage yield in climax condition ranges from 3,000 to 7,000 pounds per acre depending on rainfall.

If regression occurs as a result of heavy grazing, the tall grasses are replaced by sideoats grama, Arizona cottontop, vine mesquite, and silver bluestem initially. Continued heavy grazing and lack of periodic fire results in a plant community dominated by sand dropseed, threeawn, mesquite, prickly pear, tasajillo, tumblegrass, and red grama.

Sandy Ecological Site. The Heaton soil is in this site. The climax plant community is a post oak and blackjack oak savannah with an understory of tall and mid grasses. An abundant variety of forbs are also present. The composition by weight is about 75 percent grasses, 5 percent forbs, and 20 percent woody plants.

The climax vegetation consists of about 40 percent little bluestem, big bluestem, indiagrass, and switchgrass; 25 percent purpletop tridens, tall dropseed, Canada wildrye, silver bluestem, plains bristlegrass, Arizona cottontop, and sideoats grama; 5 percent sand lovegrass; and 5 percent sand dropseed, hooded windmillgrass, paspalum, panicum, and threeawn. The 5 percent forb composition consists of dayflower, trailing wildbean, gaura, primrose, ragweed, and sagewort. The 20 percent woody plant composition consists of 15 percent post oak and blackjack oak, and 5 percent skunkbush, bumelia, hackberry, greenbriar, pricklyash, and honeysuckle. The approximate total annual air-dry herbage yield in climax condition ranges from 3,500 to 4,500 pounds per acre depending on rainfall.

If regression occurs as a result of heavy grazing, the tall grasses give way to silver bluestem and ragweed. Continued heavy grazing and lack of periodic fire results in a plant community dominated by post oak and blackjack which shades most of the understory.

Clay Loam Ecological Site. The Tillman, Sagerton, Rowden, Springcreek, Nukrum, and Abilene soils are in this site. The climax plant community consists of short and mid grasses. The composition by weight is about 90 percent grasses, 10 percent forbs, and only a trace of woody plants.

The climax vegetation consists of 25 percent sideoats grama; 25 percent vine mesquite, Arizona cottontop, and silver bluestem; 15 percent buffalograss and blue grama; 15 percent Texas wintergrass, western wheatgrass, and Canada wildrye; 10 percent white tridens, meadow dropseed, plains bristlegrass, and Texas cupgrass. The 10 percent forb composition consists of Englemann-daisy, heath aster, ragweed, greenthread, gayfeather, gaura, trailing ratany, and Maximilian sunflower. Woody plants occasionally occurring in the landscape included vine ephedra, lotebush, and live oak. The approximate total annual air-dry herbage yield in climax condition ranges from 1,500 to 3,000 pounds per acre depending upon rainfall.

If regression occurs as a result of heavy grazing, the preferred mid grasses such as sideoats and Arizona cottontop are replaced by buffalograss and Texas wintergrass

initially. Continued heavy grazing and lack of periodic fires result in a plant community dominated by mesquite, lotebush, prickly pear, threeawn, Texas grama, ragweed, and low quality annual forbs and grasses.

Sandy Loam Ecological Site. The Winters, Enterprise, Bonti, Bastrop, Minwells, Grandmore, Grandfield, and Newcastle soils are in this site. The climax plant community is a post oak and blackjack oak savannah with a tall and mid grass understory. The composition by weight is about 80 percent grasses, 10 percent forbs, and 10 percent woody plants.

The climax vegetation consists of 20 percent little bluestem; 15 percent big bluestem, indiangrass, switchgrass, and purpletop tridens; 10 percent sideoats grama; 10 percent sand lovegrass; 20 percent Arizona cottontop, silver bluestem, vine mesquite, plains bristleggrass, and Texas wintergrass; 5 percent blue grama, buffalograss, and Scribner panicum. The 10 percent forb composition consists of Englemann-daisy, bundleflower, prairie clover, primrose, dalea, ragweed, and scurfpea. The 10 percent woody plant composition consists of post oak, blackjack oak, live oak, elm, pricklyash, bumelia, hackberry, elbowbush, and skunkbush. The approximate total annual air-dry herbage yield in climax condition ranges from 3,500 to 6,000 pounds in excellent condition depending on rainfall.

If regression occurs as a result of heavy grazing, the tall grasses are replaced initially with little bluestem and sideoats grama. Continued heavy grazing and lack of periodic fire result in a plant community dominated by post oak, mesquite, skunkbush, threeawn, and annual grasses and forbs.

Clay Slope Ecological Site. The Throck and Set soils are in this site. The climax plant community is an open mid grass prairie. The composition by weight is about 90 percent grasses, 5 percent forbs, and 5 percent woody plants.

The climax vegetation consists of about 30 percent big bluestem; 10 percent little bluestem; 10 percent indiangrass and switchgrass; 15 percent sideoats grama, Arizona cottontop, and vine mesquite; 15 percent tall and meadow dropseed, buffalograss, white tridens, and Texas wintergrass; 5 percent threeawn, hairy grama, and Texas grama. The 5 percent forb composition consists of Englemann-daisy, heath aster, sagewort, ragweed, bundleflower, trailing ratany, dotted gayfeather, and scurfpea. The 5 percent woody composition consists of hackberry, vine ephedra, elbowbush, bumelia, dalea, skunkbush, and catclaw acacia. The approximate total annual air-dry herbage yield in climax condition ranges from 2,000 to 3,500 pounds per acre depending on rainfall.

If regression occurs as a result of heavy grazing, the tall grasses are initially replaced with cottontop, sideoats grama, vine mesquite, and meadow dropseed. Continued heavy grazing and lack of periodic fire results in a plant community dominated by dropseed, threeawn, mesquite, pricklypear, and catclaw acacia.

Loamy Sand Ecological Site. The Grandfield, Bastrop, Newcastle, and Chaney soils are in this site. The climax plant community is a tall grass prairie with scattered motts of oak trees. The composition by weight is about 85 percent grasses, 5 percent forbs, and 10 percent woody plants.

The climax vegetation consists of about 25 percent big bluestem, indiangrass, and switchgrass; 30 percent little bluestem; 5 percent purpletop tridens and tall dropseed; 5 percent Canada wildrye and Texas bluegrass; 10 percent sideoats grama and sand lovegrass; and 10 percent plains bristleggrass, Arizona cottontop, silver bluestem, sand dropseed, hooded windmillgrass, sand paspalum, threeawn, and Scribner panicum. The 5 percent forb composition consists of Englemann-daisy, primrose, prairie clover, dotted gayfeather, sagewort, ragweed dayflower, trailing wildbean, bundleflower, and sensitivebriar. The 10 percent woody plant composition consists of primarily post oak with some hackberry, skunkbush, bumelia, pricklyash, greenbriar, daleas, and wild plum. The approximate annual air-dry herbage yield in climax condition ranges from 3,000 to 6,000 pounds per acre depending on rainfall.

If regression occurs as a result of heavy grazing, the tall grasses are replaced by purpletop tridens, sideoats grama, and sand lovegrass initially. Continued heavy grazing and lack of periodic fires results in a plant community dominated by post oak and greenbriar with small amounts of sand dropseed, threeawn, sand paspalum, and fall witchgrass.

Clayey Upland Ecological Site. The Leeroy soil is in this site. The climax plant community is an open mid grass prairie. The composition by weight is about 95 percent grasses, 5 percent forbs, and only a trace amount of woody plants.

The climax vegetation consists of about 20 percent sideoats grama; 20 percent vine mesquite; 15 percent Texas wintergrass; 10 percent western wheatgrass and Texas bluegrass; 10 percent buffalograss; 5 percent white tridens, silver bluestem, and Arizona cottontop; and 15 percent tall and meadow dropseed and Texas cupgrass. The 5 percent forb composition consists of sensitivebriar, heath aster, Englemann-daisy, ragweed, greenthread, and dotted gayfeather. Woody plants that occasionally occur in the landscape include hackberry, lotebush, bumelia, and vine ephedra. The approximate total annual air-dry herbage yield in climax condition ranges from 2,500 to 4,500 pounds per acre depending on rainfall.

If regression occurs as a result of heavy grazing, vine mesquite, white tridens, sideoats grama, and Arizona cottontop give way to an increase of silver bluestem, buffalograss, and Texas wintergrass initially. Continued heavy use and lack of periodic fire result in a plant community dominated by mesquite, lotebush, pricklypear, threeawn, and Texas wintergrass.

Rocky Hill Ecological Site. The Owens and Knoco soils are in this site. The climax plant community is a mixture of mid and tall grasses with scattered woody plants. The composition by weight is about 80 percent grasses, 5 percent forbs, and 15 percent woody plants.

The climax vegetation consists of about 35 percent big bluestem, indiagrass, switchgrass, purpletop tridens, and little bluestem; 15 percent sideoats grama; 15 percent Arizona cottontop, vine mesquite, Texas cupgrass, and silver bluestem; 10 percent tall and meadow dropseed; and 5 percent buffalograss, slim tridens, hairy grama, Texas wintergrass, and threeawn. The 5 percent forb composition consists of Englemann-daisy, heath aster, bush sunflower, sagewort, dotted gayfeather, trailing ratany, skullcap, gray goldaster, verbena, bundleflower, and Maximilian sunflower. The 15 percent woody composition consists of about 5 percent skunkbush sumac, littleleaf sumac, and flameleaf sumac, and 10 percent hackberry, elbowbush, bumelia, ephedra, wild plum, greenbriar, live oak, pricklyash, lotebush, catclaw, and yucca. The approximate total annual air-dry herbage yield in climax condition ranges from 1,200 to 2,400 pounds per acre depending on rainfall.

If regression occurs as a result of heavy grazing, the tall grasses are replaced by little bluestem, sideoats grama, and silver bluestem initially. Continued heavy grazing and lack of periodic fire result in a plant community dominated by buffalograss, Texas wintergrass, slim tridens, red grama, Texas grama, threeawn, ragweed, and a tremendous increase in woody plants. A few tall grasses can generally be found where they are protected by rock outcrops even in a deteriorated stage.

Deep Redland Ecological Site. The Lindy soil is in this site. The climax plant community is an open grassland with scattered trees and motts. Tall and mid grasses dominate the site. The overstory shades less than 10 percent of the site and consists primarily of live oak and post oak. The composition by weight is about 90 percent grasses, 5 percent forbs, and 5 percent woody plants.

The climax vegetation consists of about 55 percent indiagrass, big bluestem, and little bluestem; 15 percent sideoats grama, dropseeds, silver bluestem, and vine mesquite; 5 percent plains lovegrass, white tridens, and Texas cupgrass; 10 percent Texas wintergrass and Canada wildrye; 5 percent buffalograss, fall witchgrass, threeawn, and Scribner panicum. The 5 percent forb composition consists of Englemann-daisy,

bush sunflower, Maximilian sunflower, gayfeather, sagewort, halfshrub sundrop, bundleflower, sensitivebriar, daleas, scurfspea, western indigo, heath aster, and western ragweed. The 5 percent woody plant composition consists of primarily live oak and post oak but also included trace amounts of hackberry, blackjack oak, sumacs, bumelia, greenbriar, ephedra, and elbowbush. The approximate total annual air-dry herbage yield in climax condition ranges from 3,000 to 6,000 pounds per acre depending upon rainfall.

If regression occurs as a result of heavy grazing, the tall grasses are replaced by sideoats grama, tall dropseed, silver bluestem, Texas wintergrass, and buffalograss initially. Continued heavy grazing and lack of periodic fire results in a plant community dominated by Texas wintergrass, buffalograss, and many woody species such as mesquite.

Very Shallow Clay Ecological Site. The Knoco soil is in this site. The climax plant community is a short and mid grass site dominated by sideoats grama. Woody species are scattered and shrubby. The composition by weight is about 95 percent grasses, 5 percent forbs, and only trace amounts of woody plants.

The climax vegetation consists of about 40 percent sideoats grama; 20 percent buffalograss; 10 percent alkali sacaton; 10 percent silver bluestem; and 15 percent hairy grama, sand dropseed, meadow dropseed, slim tridens, and threeawn. The 5 percent forb composition consists of western ragweed, dotted gayfeather, indian rushpea, and plains blackfoot. Trace amounts of woody plants could be found and included lotebush, pricklypear, ephedra, and four-wing saltbush. The approximate total annual air-dry herbage yield in climax condition ranges from 400 to 1,200 pounds per acre depending upon rainfall.

If regression occurs as a result of heavy grazing, sideoats grama is replaced by an increase in buffalograss initially. Continued heavy grazing and lack of periodic fire result in a plant community dominated by threeawn, Texas grama, prickly pear, mesquite, and lotebush.

Shallow Clay Ecological Site. The Vernon soil is in this site. The climax plant community is a short and mid grass site dominated by sideoats grama and buffalograss. Little bluestem grows in areas of more favored moisture. The composition by weight is about 90 percent grasses, 5 percent forbs, and 5 percent woody plants.

The climax vegetation consists of about 35 percent sideoats grama; 15 percent silver bluestem; 10 percent buffalograss; 10 percent vine mesquite; 5 percent Texas wintergrass; 5 percent Arizona cottontop; 5 percent meadow dropseed and hairy grama; and 5 percent slim tridens and threeawn. The 5 percent forb composition consists of western ragweed, Englemann-daisy, bundleflower, and sagewort. The 5 percent woody plant composition consists of ephedra, dalea, catclaw, hackberry, and agarito. The total air-dry herbage yield in climax condition ranges from 1,000 to 2,500 pounds per acre depending on rainfall.

If regression occurs as a result of heavy grazing, sideoats grama, vine mesquite, and silver bluestem are replaced by buffalograss initially. Continued heavy grazing and lack of periodic fire results in a plant community dominated by low vigor buffalograss, annual grasses and forbs, mesquite, lotebush, and prickly pear.

Tight Sandy Loam Ecological Site. The Truce, Weswind and Bluegrove soils are in this site. The climax plant community is a scattered post oak savannah with a mid grass understory. The composition by weight is about 90 percent grasses, 5 percent forbs, and 5 percent woody plants.

The climax vegetation consists of about 25 percent sideoats grama; 45 percent Arizona cottontop, vine mesquite, silver bluestem, little bluestem, and Texas wintergrass; 10 percent blue grama and buffalograss; 5 percent sand dropseed, hairy grama, and slim tridens; and 5 percent threeawn. The 5 percent forb composition consists of Englemann-daisy, ragweed, sagewort, trailing ratany, heath aster, and dotted gayfeather. The 5 percent woody plant composition consists of post oak, pricklyash, lotebush, skunkbush, greenbriar, bumelia, and

catclaw acacia. The approximate total annual air-dry herbage yield in climax condition ranges from 2,000 to 4,000 pounds per acre depending on rainfall.

If regression occurs as a result of heavy grazing, the desirable mid grasses are initially replaced by buffalograss, Texas wintergrass, and hooded windmillgrass. Continued heavy grazing and lack of periodic fire results in a plant community dominated by mesquite, buffalograss, hairy tridens, Texas grama, and sand dropseed.

Low Stony Hill Ecological Site. The Palopinto soil is in this site. The climax plant community is a live oak and post oak savannah with an understory of mid grasses and scattered tall grasses. The composition by weight is about 75 percent grasses, 10 percent forbs, and 15 percent woody plants.

The climax vegetation consists of about 15 percent sideoats grama; 15 percent little bluestem; 25 percent Canada wildrye, vine mesquite, green sprangletop, Texas cupgrass, dropseeds, silver bluestem, and Texas wintergrass; 10 percent indiangrass and big bluestem; and 10 percent buffalograss and hairy grama. The 10 percent forb composition consists of Englemann-daisy, bush sunflower, orange zexmenia, sagewort, and gayfeather. The 15 percent woody composition consists of live oak, post oak, agarito, yucca, bush honeysuckle, pricklyash, acacia, and pricklypear. The approximate total annual air-dry herbage yield in climax condition ranges from 2,500 to 3,500 pounds per acre depending on rainfall.

If regression occurs as a result of heavy grazing, the tall grasses as well as the desirable mid grasses are replaced initially by buffalograss, slim tridens, and Texas wintergrass. Continued heavy grazing and lack of periodic fire results in a plant community dominated by threeawn, red grama, hairy tridens, acacia, pricklypear, and on some sites blueberry juniper.

Steep Rocky Ecological Site. The Set and Palopinto soils are in this site. The climax plant community is primarily a mid grass site with scattered oak. The composition by weight is about 75 percent grasses, 10 percent forbs, and 15 percent woody plants.

The climax vegetation consists of about 35 percent little bluestem; 15 percent sideoats grama; 15 percent Texas cupgrass, Texas wintergrass, and silver bluestem; 5 percent green sprangletop, indiangrass, dropseed, and plains lovegrass; and 5 percent fall witchgrass, slim tridens, and hairy grama. The 10 percent forb composition consists of bush sunflower, Englemann-daisy, orange zexmenia, bundleflowers, and catclaw sensitivebriar. The 15 percent woody plant composition consists of live oak, sumacs, hackberry, bumelia, yucca, and juniper. The approximate total annual air-dry herbage yield in climax condition ranges from 1,000 to 3,000 pounds per acre depending on rainfall.

If regression occurs as a result of heavy grazing, little bluestem is replaced by sideoats grama, silver bluestem, and Texas wintergrass initially. Continued heavy grazing and lack of periodic fire results in a plant community dominated by red grama, hairy tridens, annual grasses, and juniper.

Claypan Prairie Ecological Site. The Kamay, Thurber, Deandale, and Callahan soils are in this site. The climax plant community is an open mid and short grass prairie. The composition by weight is about 95 percent grasses, 5 percent forbs, and only a trace amount of woody plants.

The climax vegetation consists of about 25 percent sideoats grama; 40 percent Arizona cottontop, vine mesquite, dropseeds, silver bluestem, and white tridens; 15 percent buffalograss and blue grama; and 15 percent Texas wintergrass and western wheatgrass. The 5 percent forb composition consists of Englemann-daisy, bush sunflower, heath aster, gayfeather, ragweed, sagewort, green thread, Maximilian sunflower, trailing ratany, and sensitivebriar. The trace amounts of woody plants included vine ephedra and lotebush. The approximate total annual air-dry herbage yield in climax condition ranges from 1,500 to 3,500 pounds per acre depending on rainfall.

If regression occurs as a result of heavy grazing, buffalograss and Texas wintergrass increase to become the dominants initially. Continued heavy grazing and lack of periodic

fire results in a plant community dominated by mesquite, lotebush, pricklypear, hairy tridens, tumble lovegrass, and Japanese brome may become the dominant grass.

Sandstone Hill Ecological Site. The Exray-Loving, Jacksboro, and Jolly-Rock outcrop soils are in this site. The climax plant community is a mixture of mid and tall grasses with an open stand of post oak trees. The composition by weight is about 80 percent grasses, 5 percent forbs, and 15 percent woody plants.

The climax vegetation consists of about 35 percent little bluestem, 20 percent big bluestem, indiagrass, and switchgrass, 15 percent sideoats grama and sand lovegrass, and 10 percent silver bluestem, hairy grama, Texas wintergrass, dropseeds, and purpletop tridens. The 5 percent forb composition consists of Englemann-daisy, bush sunflower, bundleflower, and ragweed. The 15 percent woody plant composition consists of primarily post oak and blackjack oak along with some elm, greenbriar, bush honeysuckle, elbowbush, bumelia, and pricklyash. The approximate total annual air-dry herbage yield in climax condition ranges from 2,500 to 4,000 pounds per acre depending on rainfall.

If regression occurs as a result of heavy grazing, the tall grasses are initially replaced with little bluestem and sideoats grama and then by silver bluestem and hairy grama. Continued heavy grazing and lack of periodic fire results in a plant community dominated by skunkbush, threeawn, sand dropseed, annual grasses, post oak, greenbriar, and elm.

Redland Ecological Site. The Hensley soil is in this site. The climax plant community is an oak savannah where the overstory shades about 20 percent of the site and little bluestem is the dominant grass. The composition by weight is about 80 percent grasses, 5 percent forbs, and 15 percent woody plants.

The climax vegetation consists of about 40 percent little bluestem, big bluestem, and indiagrass; 20 percent sideoats grama, tall dropseed, silver bluestem, vine mesquite, Texas cupgrass, purpletop tridens, and plains lovegrass; 15 percent Texas wintergrass and Canada wildrye; and 5 percent fall witchgrass, buffalograss, and threeawn. The 5 percent forb composition consists of Maximilian sunflower, bush sunflower, Englemann-daisy, gayfeather, sagewort, halfshrub sundrop, bundleflower, scurfpea, heath aster, and western ragweed. The 15 percent woody plant composition consists of primarily live oak, post oak, Texas oak, and bigelow oak along with some elm, hackberry, redbud, bumelia, sumac, elbowbush, greenbriar, vine ephedra, bush honeysuckle, and dalea. The approximate total annual air-dry herbage yield ranges from 2,500 to 5,000 pounds per acre depending on rainfall.

If regression occurs as a result of heavy grazing, the tall grasses are initially replaced by sideoats grama, Texas wintergrass, silver bluestem, and buffalograss. Continued heavy grazing and lack of periodic fire results in a plant community dominated by buffalograss, Texas grama, hairy tridens, and Texas wintergrass with an increase of mesquite, lotebush, and low quality forbs.

Sandy Bottomland Ecological Site. The Lincoln soil is in this site. The climax plant community is a tall grass site dominated by switchgrass, big bluestem, and little bluestem. The composition by weight is about 90 percent grasses, 5 percent forbs, and 5 percent woody plants.

The climax vegetation consists of about 55 percent switchgrass, big bluestem, and indiagrass, 15 percent little bluestem, 15 percent western wheatgrass and Canada wildrye, 5 percent giant dropseed, Scribner panicum, purpletop tridens, sand lovegrass, sideoats grama, vine mesquite, and giant sundered. The 5 percent forb composition consists of partridge pea, Maximilian sunflower, sagewort, heath aster, and bundleflower. The 5 percent woody plant composition consists of wild plum, bumelia, hackberry, soapberry, prickly ash, and willow. The approximate total annual air-dry herbage yield ranges from 3,000 to 7,000 pounds per acre depending on rainfall.

If regression occurs as a result of heavy grazing, the tall grasses are initially replaced by little bluestem and giant sandreed. Continued heavy grazing and lack of periodic fire leads to a community of threeawn, sacaton, and inland saltgrass. Eventually the site will

develop to the extent of forming dense stands of salt cedar. Common bermudagrass is frequently washed in from the river and allowed to establish in lower successional stages.

Bouldery Hill Ecological Site. The Shatruce soil is in this site. The climax vegetation was dominated by little bluestem with a significant amount of woody plants. The composition by weight is about 70 percent grasses, 5 percent forbs, and 25 percent woody plants.

The climax vegetation consists of about 45 percent little bluestem, 10 percent indiangrass, 5 percent sideoats grama and trace amounts of various other grasses. The 5 percent forb composition consists of western ragweed, Englemann-daisy, bundleflower, croton, prairie clover, and lespedeza. The 25 percent woody plant composition consists of primarily post oak but has some blackjack oak, Texas ash, greenbriar, skunkbush, elm, elbowbush, bumelia, and prickly ash. The approximate total annual air-dry herbage yield in climax condition ranges from 700 to 2,000 pounds per acre depending on rainfall.

As regression occurs, little bluestem and indiangrass are replaced with sideoats grama, dropseeds, hooded windmillgrass, and silver bluestem. Continued regression leads to threeawn, low panicum, red lovegrass, and an increase in post oak, skunkbush, mesquite, and pricklypear. Cattle graze this site very little because of the steep slope.

Sand Hills Ecological Site. The Goodnight soil is in this site. The climax plant community is a tall grass site dominated by big and little bluestem, switchgrass, and indiangrass. The composition by weight is about 90 percent grasses, 5 percent forbs, and 5 percent woody plants.

The climax vegetation consists of about 20 percent little bluestem; 45 percent big bluestem, indiangrass, and switchgrass; 20 percent giant sandreed, sand dropseed, giant dropseed, sand lovegrass, and sideoats grama; and 5 percent hooded windmillgrass, Wright threeawn, fringed signalgrass, red lovegrass, and sand paspalum. The 5 percent forb composition consists of wild buckwheat, camphorweed, catclaw sensitivebriar, western ragweed, and Illinois bundleflower. The 5 percent woody plant composition consists of live oak, post oak, hackberry, prickly ash, bumelia, greenbriar, yucca, and sand sagebrush. The approximate total annual air-dry herbage yield in climax condition ranges from 1,500 to 4,000 pounds per acre depending upon rainfall.

If regression occurs as a result of heavy grazing, the tall grasses give way to an increase in little bluestem and giant sandreed initially. Continued heavy grazing and lack of periodic fire results in a plant community dominated by red lovegrass, tumblegrass, fringed signalgrass, threeawn, and dense thickets of greenbriar and an increase in oak species. The most severe stages are dominated by very dense thickets of greenbriar and oak trees.

Agricultural Waste Management

Soil properties are important considerations in areas where soils are used as sites for the treatment and disposal of organic waste and wastewater. Selection of soils with properties that favor waste management can help to prevent environmental damage.

Table 8, table 9, and table 10 show the degree and kind of soil limitations affecting the treatment of agricultural waste, including municipal and food-processing wastewater and effluent from lagoons or storage ponds. Municipal wastewater is the waste stream from a municipality. It contains domestic waste and may contain industrial waste. It may have received primary or secondary treatment. It is rarely untreated sewage. Food-processing wastewater results from the preparation of fruits, vegetables, milk, cheese, and meats for public consumption. In places it is high in content of sodium and chloride. In the context of these tables, the effluent in lagoons and storage ponds is from facilities used to treat or store food-processing wastewater or domestic or animal waste. Domestic and food-processing wastewater is very dilute, and the effluent from the facilities that treat or store it commonly is very low in content of carbonaceous and nitrogenous material; the content of nitrogen commonly ranges from 10 to 30 milligrams per liter. The wastewater from animal waste

treatment lagoons or storage ponds, however, has much higher concentrations of these materials, mainly because the manure has not been diluted as much as the domestic waste. The content of nitrogen in this wastewater generally ranges from 50 to 2,000 milligrams per liter. When wastewater is applied, checks should be made to ensure that nitrogen, heavy metals, and salts are not added in excessive amounts.

The ratings in the tables are for waste management systems that not only dispose of and treat organic waste or wastewater but also are beneficial to crops (application of manure and food-processing waste, application of sewage sludge, and disposal of wastewater by irrigation) and for waste management systems that are designed only for the purpose of wastewater disposal and treatment (overland flow of wastewater, rapid infiltration of wastewater, and slow rate treatment of wastewater).

Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect agricultural waste management. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Application of manure and food-processing waste not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. Manure is the excrement of livestock and poultry, and food-processing waste is damaged fruit and vegetables and the peelings, stems, leaves, pits, and soil particles removed in food preparation. The manure and food-processing waste are either solid, slurry, or liquid. Their nitrogen content varies. A high content of nitrogen limits the application rate. Toxic or otherwise dangerous wastes, such as those mixed with the lye used in food processing, are not considered in the ratings.

The ratings are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the waste is applied, and the method by which the waste is applied. The properties that affect absorption include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, and available water capacity. The properties that affect plant growth and microbial activity include reaction, the sodium adsorption ratio, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

Application of sewage sludge not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. In the context of this table, sewage sludge is the residual product of the treatment of municipal sewage. The solid component consists mainly of cell mass, primarily bacteria cells that developed during secondary treatment and have incorporated soluble organics into their own bodies. The sludge has small amounts of sand, silt, and other solid debris. The content of nitrogen varies. Some sludge has constituents that are toxic to plants or hazardous to the food chain, such as heavy metals and exotic organic compounds, and should be analyzed chemically prior to use.

The content of water in the sludge ranges from about 98 percent to less than 40 percent. The sludge is considered liquid if it is more than about 90 percent water, slurry if it is about 50 to 90 percent water, and solid if it is less than about 50 percent water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the sludge is applied, and the method by which the sludge is applied. The properties that affect absorption, plant growth, and microbial activity include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, available water capacity, reaction, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of sludge. Permanently frozen soils are unsuitable for waste treatment.

Disposal of wastewater by irrigation not only disposes of municipal wastewater and wastewater from food-processing plants, lagoons, and storage ponds but also can improve crop production by increasing the amount of water available to crops. The ratings in the table are based on the soil properties that affect the design, construction, management, and performance of the irrigation system. The properties that affect design and management include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, slope, and flooding. The properties that affect construction include stones, cobbles, depth to bedrock or a cemented pan, depth to a water table, and ponding. The properties that affect performance include depth to bedrock or a cemented pan, bulk density, the sodium adsorption ratio, salinity, reaction, and the cation-exchange capacity, which is used to estimate the capacity of a soil to adsorb heavy metals. Permanently frozen soils are not suitable for disposal of wastewater by irrigation.

Overland flow of wastewater is a process in which wastewater is applied to the upper reaches of sloped land and allowed to flow across vegetated surfaces, sometimes called terraces, to runoff-collection ditches. The length of the run generally is 150 to 300 feet. The application rate ranges from 2.5 to 16.0 inches per week. It commonly exceeds the rate needed for irrigation of cropland. The wastewater leaves solids and nutrients on the vegetated surfaces as it flows downslope in a thin film. Most of the water reaches the collection ditch, some is lost through evapotranspiration, and a small amount may percolate to the ground water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, and the design and construction of the system. Reaction and the cation-exchange capacity affect absorption. Reaction, salinity, and the sodium adsorption ratio affect plant growth and microbial activity. Slope, permeability, depth to a water table, ponding, flooding, depth to bedrock or a cemented pan, stones, and cobbles affect design and construction. Permanently frozen soils are unsuitable for waste treatment.

Rapid infiltration of wastewater is a process in which wastewater applied in a level basin at a rate of 4 to 120 inches per week percolates through the soil. The wastewater may eventually reach the ground water. The application rate commonly exceeds the rate needed for irrigation of cropland. Vegetation is not a necessary part of the treatment; hence, the basins may or may not be vegetated. The thickness of the soil material needed for proper treatment of the wastewater is more than 72 inches. As a result, geologic and hydrologic investigation is needed to ensure proper design and performance and to determine the risk of ground-water pollution.

The ratings in the table are based on the soil properties that affect the risk of pollution and the design, construction, and performance of the system. Depth to a water table, ponding, flooding, and depth to bedrock or a cemented pan affect the risk of pollution and the design and construction of the system. Slope, stones, and cobbles also affect design and construction. Permeability and reaction affect performance. Permanently frozen soils are unsuitable for waste treatment.

Slow rate treatment of wastewater is a process in which wastewater is applied to land at a rate normally between 0.5 inch and 4.0 inches per week. The application rate commonly exceeds the rate needed for irrigation of cropland. The applied wastewater is treated as it moves through the soil. Much of the treated water may percolate to the ground water, and some enters the atmosphere through evapotranspiration. The applied water generally is not allowed to run off the surface. Waterlogging is prevented either through control of the application rate or through the use of tile drains, or both.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, and the application of waste. The properties that affect absorption include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, depth to bedrock or a cemented pan, reaction, the cation-exchange capacity, and slope. Reaction, the sodium adsorption ratio, salinity, and bulk density affect plant growth and microbial activity. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood of wind erosion or water erosion. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

Recreation

The soils of the survey area are rated in table 11 and table 12 according to limitations that affect their suitability for recreation. The ratings are both descriptive and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in table 11 and table 12 can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of

camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Off-road motorcycle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a seasonal high water table, ponding, flooding, and texture of the surface layer.

Golf course fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

Wildlife

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Young County lies within three major land resource areas (MLRA); MLRA 80B—North Central Prairie; MLRA 78C—Central Rolling Red Plains, Eastern Part; and MLRA 78 A—Rolling Limestone Prairie. Though, vegetation is more characteristic of the West Cross

Timbers resource area, where post oak, blackjack oak and motts of live oak, Ashe juniper, cedar, elm, and other species of shrubs and trees can be found within the county.

Young County has a diverse wildlife makeup. As wildlife becomes a major source of income for many farms and ranches, habitat improvement for desired species has become more important. Major land uses are rangeland, pastureland, and cropland.

Of these land uses approximately 66 percent may be considered ideal wildlife habitat for various avian and terrestrial wildlife species. Rangeland is the primary land use where livestock and wildlife are managed. Cropland acres are important to the wildlife population, where winter wheat provides a significant winter food source for white-tailed deer, Rio Grande turkeys, morning dove, waterfowl, and Sandhill cranes. Other crops such as sunflower can be managed to provide additional food sources for wildlife during late summer and early fall.

Other land uses include urban and built-up area as well as water bodies. Major water bodies in the county are Possum Kingdom Lake, Lake Graham, Lake Eddleman, the Brazos River, and other streams, creeks, ponds, and lakes, which provide important habitat for various wildlife species (aquatic, terrestrial, and waterfowl).

Prime wildlife habitats are riparian areas adjacent to major rivers and streams that traverse the county. Wooded areas and fence lines grown up in various desirable vegetation adjacent to cropland, pastureland, and rangeland also provide quality food, escape, and travel cover. There is still a wide diversity of game and non-game wildlife species in the county.

Desired game species are white-tailed deer, Rio Grande turkey, quail, and dove. The fox squirrel is readily found, as are raccoon, opossum, skunk, small rodents, raptors, and various songbirds. Predator species such as bobcat, coyote, and fox are also prevalent throughout the county. Reptiles and amphibians may also be found in abundant numbers. Currently there are no federally listed threatened or endangered species of plants or animals listed for Young County. Young County is on the migration route of the Whooping Crane.

Major water bodies, numerous creeks and streams, and many constructed ponds provide ideal habitat for a variety of varied aquatic species. Water quality in some of the smaller water bodies may not be suitable for the stocking of finfish species. Many ponds have been stocked with blue and channel catfish. Bass, bluegill, and redear sunfish are stocked in water bodies of high water quality that lack in suspended soil particle. Species such as green sunfish, bullhead catfish, gar, longear sunfish, carp, and various minnows are also found in addition to the previously mentioned species in managed and unmanaged water bodies.

Natural wetlands are soils with hydric inclusions along the Brazos River, and low lying or depressional areas found as an inclusion or as a component of a complex soil series of which wetland characteristics may be found. These areas are important to the ecosystem in that they provide food, cover, and nesting areas for many wildlife species. Many of the migratory waterfowl use the many ponds, lakes, and wetland areas as resting and feeding stops on their annual migration through the area.

Fragmentation of wildlife habitat is beginning to occur as many of the larger ranches are being divided and sold. Landowners are becoming more concerned about the management of habitat for wildlife.

Management practices that will improve or enhance the habitat for desired species are being considered and applied to improve the quality and quantity of wildlife. Such practices may include one or a combination of the following conservation measures used to improve the habitat for single or a number of desired wildlife species.

Brush management for the control of undesirable species that encroach upon the landscape improves water quality and quantity. The introduction of legumes or cool season annual forbs and grasses can be seeded or overseeded on improved pastureland, and can supplement the forb component, and incorporate a high quality forage for deer, turkey, and quail. (Refraining from planting of improved grass species or the application of herbicides along the edge of pastures and wooded areas is an

excellent method to encourage the production of desirable forb species used by deer, turkey, and quail.) Allowing the areas along fence lines to grow up in forbs and browse species will improve quail habitat. Winter disking along roadside field borders, brush lines, and right-of-ways will also encourage forb production.

Grazing management practices such as prescribed grazing and use exclusion can be incorporated into farm and ranch operations for the improvement of desirable vegetation. The use of prescribed burning may be used in some instances to manage undesirable woody species, and improve the germination of desirable grasses, forbs, and woody species. Extreme care must be taken when using prescribed burning as a management tool.

Farming practices such as conservation cropping systems and crop residue use can produce a food source by providing interspersed grasses and legumes, and making available wasted grain crops on the soil surface for various game and song birds, as well as migratory waterfowl.

Wildlife Habitat

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 13, table 14, table 15, and table 16, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated *not limited*, *somewhat limited*, or *very limited*. A rating of *not limited* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *somewhat limited* indicates that the element or kind of habitat can be established, improved, or maintained in most places, but limitations of a habitat can be severe for a designated element or kind of habitat. Moderately intensive to intensive management is required for satisfactory results in most places, and management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are

considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are mountain mahogany, bitterbrush, snowberry, and big sagebrush.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Habitat for rangeland wildlife consists of areas of shrubs and wild herbaceous plants. Wildlife attracted to rangeland include antelope, deer, sage grouse, meadowlark, and lark bunting.

Hydric Soils

In this section, hydric soils are defined and described.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin, 1979; National Research Council, 1995; Tiner, 1985; USACOE, 1987). Criteria for each of the characteristics must be met for areas to be identified as wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough

during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). The criteria are used to identify a phase of a soil series that normally is also a hydric soil. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 1998) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period to be considered hydric, they generally exhibit certain properties that can be observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in "Field Indicators of Hydric Soils in the United States" (Hurt, 2002).

For information regarding hydric soils, refer to the USDA Natural Resources Conservation Service Soil Data Mart at <http://soildatamart.nrcs.usda.gov>.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the data in the tables described under the heading "Soil Properties."

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology;

locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Table 17 and table 18 shows the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches—the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Sanitary Facilities

Table 19 and table 20 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both descriptive and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence

interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in down slope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A *trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact, and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an *area sanitary landfill*, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil

from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Construction Materials

Table 21 and table 22 provide information about the soils as potential sources of gravel, sand, topsoil, reclamation material, and roadfill. Normal compaction, minor processing, and other standard construction practices are assumed.

The soils are rated *good*, *fair*, or *poor* as potential sources of sand and gravel. A rating of good or fair means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 21, only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

The soils are rated *good*, *fair*, or *poor* as potential sources of topsoil, reclamation material, and roadfill. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate

the degree to which the features limit the soils as sources of topsoil, reclamation material, or roadfill. The lower the number, the greater the limitation.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Water Management

Table 23 provides information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The ratings are both descriptive and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate

gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include physical and chemical properties, and clay mineralogy.

Engineering Properties

Table 24 provides the engineering classifications and the range of properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture.

These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters across. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (AASHTO, 2004) and the system adopted by the American Association of State Highway and Transportation Officials (ASTM, 2005).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches across and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches across is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches across and 3 to 10 inches across are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches across based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of particle-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is generally omitted in the table.

Physical Soil Properties

Table 25 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle-size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle-sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In the table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 millimeters to 0.05 millimeter in diameter. In the table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In the table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle-size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (oven-dry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar or 1/10 bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (K-sat) refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity (K-sat). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3 bar or 1/10 bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil. Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 25, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue of the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in table 25 as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of several factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.
- 4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.
8. Soils that are not subject to wind erosion because of rock fragments on the surface or because of surface wetness.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Chemical Soil Properties

Table 26 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in decisiemens per meter (dS/m) at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an

increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

Soil Features

Table 27 provides estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restricts roots or otherwise provides an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For *uncoated steel*, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For *concrete*, the risk of corrosion also is expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Water Features

Table 28 provides estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms. The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. Table 28 indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely gray colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. Table 28 indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered is local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Physical, Chemical, and Clay Mineralogy Analyses of Selected Soils

The results of physical analysis of several typical pedons in the survey area are given in table 29, the results of chemical analysis in table 30, and the results of grain count analysis in table 31. The data are for soils sampled at carefully selected sites. Unless otherwise indicated, the pedons are typical of the series. They are described in the section "Soil Series and Their Morphology." Soil samples were analyzed by National Soil Survey Laboratory, Lincoln, Nebraska.

Most determinations, except those for grain-size analysis and bulk density, were made on soil material smaller than 2 millimeters across. Measurements reported as percent or quantity of unit weight was calculated on an oven-dry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods (USDA-NRCS, 1996).

Coarse materials—(2 to 75 millimeters fraction) weight estimates of the percentages of all material less than 75 millimeters (3B1).

Sand—(0.05- to 2.0-millimeter fraction) weight percentages of material less than 2 millimeters (3A1).

Silt—(0.002- to 0.05-millimeter fraction) pipette extraction, weight percentages of all material less than 2 millimeters (3A1).

Clay—(fraction less than 0.002-millimeter) pipette extraction, weight percentages of material less than 2 millimeters (3A1).

Linear extensibility—change in clod dimension based on whole soil (3D4).

Bulk density of less than 2-millimeter material, saran-coated clods field moist (3B1a), 1/3 bar (3B1b), oven-dry (3B1c).

Water retained—pressure extraction, percentage of oven-dry weight of less than 2-millimeter material; 1/3 bar (3C1), 15 bars (3C2).

Organic carbon—wet combustion. Walkley-Black modified acid-dichromate, ferric sulfate titration (6A1c, obsolete).

Reaction (pH)—1:1 water dilution (4C1a2a1).

Extractable cations—ammonium acetate pH 7.0, ICP; calcium (6N2e, 6N2f), magnesium (6O2d, 6O2e), sodium (6P2b, 6P2c), potassium (6Q2b, 6Q2c).

Cation exchange capacity—sum of cations (5A3a).

Base saturation—ammonium acetate, pH 7.0 (5C1).

Sodium adsorption ratio (5D2).

Carbonate as calcium carbonate—(fraction less than 2 millimeters [80 mesh]) manometric (6E1g).

Electrical conductivity—saturation extract (8A3a).

Optical grain count—grain mounts, epoxy method (7B1a).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1998; Soil Survey Staff, 1999). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 32 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is *Alfisol*.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis, and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is *Ustalf* (*Ust*, meaning *burnt*, plus *alf*, from *Alfisol*).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is *Haplustalfs* (*Hapl*, meaning minimal horizonation, plus *ustalf*, the suborder of the Alfisols that has an ustic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is *Typic Haplustalfs*.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is *fine, mixed, active, thermic Typic Haplustalfs*.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil that is typical of the series in the survey area is described. Some of the typifying pedons described below are not exclusively located within the boundaries of Young County, but are typical pedons for the series in the MLRA survey area, of which Young County is located. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (Soil Survey Division Staff, 1993). Many of the

technical terms used in the descriptions are defined in "Soil Taxonomy" (Soil Survey Staff, 1999) and in "Keys to Soil Taxonomy" (Soil Survey Staff, 1998). Unless otherwise indicated, colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the series.

Abilene Series

The Abilene series is very deep, nearly level, well drained soils on remnant paleoterraces. These soils are moderately slowly permeable. They formed in calcareous loamy alluvium. Slope ranges from 0 to 1 percent. The soils of the Abilene series are fine, mixed, superactive, thermic Pachic Argiustolls.

Typical pedon of Abilene loam, 0 to 1 percent slopes; from the intersection of Texas Highway 114 and Texas Highway 79 in Olney, 1.5 miles north on Texas Highway 79, 0.6 mile east on Elo road, and 40 feet north in rangeland.

- A—0 to 9 inches; brown (7.5YR 4/2) loam, dark brown (7.5YR 3/2) moist; weak medium subangular blocky structure parting to moderate fine and medium granular; hard, friable; common fine and medium roots and pores; slightly alkaline; clear smooth boundary.
- Bt1—9 to 16 inches; brown (7.5YR 4/2) clay, dark brown (7.5YR 3/2) moist; moderate fine and medium subangular blocky structure; hard, firm; few fine and medium roots and pores; common distinct clay films on surfaces of peds; slightly alkaline; gradual smooth boundary.
- Bt2—16 to 28 inches; brown (7.5YR 4/3) clay, dark brown (7.5YR 3/3) moist; moderate fine and medium subangular blocky structure; hard, firm; few fine roots and pores; common distinct clay films on surfaces of peds; few calcium carbonate concretions; slightly effervescent; slightly alkaline; clear smooth boundary.
- Btk—28 to 37 inches; brown (7.5YR 5/4) clay, brown (7.5YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, firm; few fine roots; few faint clay films on surfaces of peds; 10 percent nodules, films, and threads of calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.
- Bk—37 to 45 inches; pink (7.5YR 7/4) silty clay loam, light brown (7.5YR 6/4) moist; weak fine granular structure; slightly hard, friable; 40 percent nodules, soft masses, films, and threads of calcium carbonate; violently effervescent; moderately alkaline; clear smooth boundary.
- Bck1—45 to 54 inches; brown (7.5YR 4/4) clay loam, dark brown (7.5YR 3/4) moist; weak fine and medium subangular blocky structure; hard, firm; 16 percent nodules, films, and threads of calcium carbonate; violently effervescent; moderately alkaline; clear smooth boundary.
- Bck2—54 to 80 inches; reddish yellow (7.5YR 6/6) silty clay loam; strong brown (7.5YR 5/6) moist; common medium distinct yellow (10YR 7/6) mottles; weak fine subangular blocky structure; slightly hard, friable; 33 percent concretions, soft masses, films, and threads of calcium carbonate; 15 percent sandstone fragments; 2 percent ferro-manganese concretions; violently effervescent; moderately alkaline.

The solum thickness is greater than 60 inches. Depth to a calcic horizon ranges from 28 to 54 inches. Masses of calcium carbonates are within 10 to 28 inches of the surface. The mollic epipedon is more than 20 inches thick.

The A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 or 3. Reaction ranges from neutral to moderately alkaline.

The Bt horizons have hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 or 3. Texture is clay loam, silty clay loam, or clay. Reaction ranges from neutral to moderately alkaline.

The Btk horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 2 to 4. Texture is clay loam or clay. Reaction ranges from neutral to moderately alkaline. Coarse fragments range from none to 5 percent by volume and consists mainly of calcium carbonate nodules and limestone fragments.

The Bk or BCK horizons have hue of 5YR to 10YR, value of 5 to 8, and chroma of 2 to 6. Texture is loam or clay loam. Reaction is slightly alkaline or moderately alkaline. Calcium carbonate contents range from 15 to 40 percent.

Anocon Series

The Anocon series is very deep, very gently sloping, well drained soils on toeslopes of ridges. These soils are moderately slowly permeable. They formed in loamy and clayey slope colluvium or slope alluvium. Slope ranges from 1 to 3 percent. The soils of the Anocon series are fine, mixed, active, thermic Udic Argiustolls.

Typical pedon of Anocon fine sandy loam, 1 to 3 percent slopes; from the intersection of Texas Highway 16 and Texas Highway 114 in Loving, 5.7 miles north on Texas Highway 16, 2.5 miles east southeast on Stewart Ranch road, 0.2 mile south, and 100 feet west in rangeland.

- A—0 to 12 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, friable; common fine and few medium roots; common fine pores; few wormcasts; neutral; clear smooth boundary.
- AB—12 to 18 inches; brown (7.5YR 5/4) sandy loam, brown (7.5YR 4/4) moist; weak fine and medium granular structure; slightly hard, friable; few fine roots; neutral; gradual smooth boundary.
- Bt1—18 to 22 inches; brown (7.5YR 5/4) sandy clay loam, brown (7.5YR 4/4) moist; moderate fine subangular blocky structure; hard, firm; few very fine roots; common faint clay films on surfaces of peds; 1 percent ferro-manganese concretions; neutral; gradual smooth boundary.
- Bt2—22 to 32 inches; brown (7.5YR 5/4) clay, brown (7.5YR 4/4) moist; moderate fine and medium subangular blocky structure; very hard, very firm; few very fine roots; few distinct clay films on surfaces of peds; 1 to 2 percent ferro-manganese concretions; neutral; gradual smooth boundary.
- Bt3—32 to 56 inches; brownish yellow (10YR 6/6) clay, yellowish brown (10YR 5/6) moist; moderate medium subangular blocky structure; very hard, very firm; few distinct clay films on surfaces of peds; common medium distinct reddish yellow (7.5YR 6/8) and strong brown (7.5YR 5/8) irregular shaped ferro-manganese concretions with sharp boundaries in the matrix; slightly alkaline; gradual smooth boundary.
- BCt1—56 to 72 inches; brownish yellow (10YR 6/6) clay loam, yellowish brown (10YR 5/6) moist; weak medium subangular blocky structure; very hard, firm; few faint clay films on surfaces of peds; 1 percent ferro-manganese concretions; few medium distinct red (2.5YR 5/8), and common medium distinct reddish yellow (7.5YR 6/6) irregularly shaped iron concretions with sharp boundaries in matrix; common medium distinct white (10YR 8/2) irregularly shaped iron depletions with sharp boundaries in the matrix; moderately alkaline; gradual smooth boundary.
- BCt2—72 to 80 inches; reddish yellow (7.5YR 6/6) clay loam, strong brown (7.5YR 5/6) moist; weak fine subangular blocky structure; hard, firm; few faint clay films on surfaces of peds; few concretions of calcium carbonate; few pockets of ferro-manganese; common coarse distinct, very pale brown (10YR 8/3) irregularly shaped iron depletions with sharp boundaries in matrix; weakly effervescent; moderately alkaline.

The solum thickness ranges from 60 to more than 80 inches.

The A horizon has colors in hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 or 3. Texture is fine sandy loam. Reaction is slightly acid or neutral.

The AB horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4. Texture is fine sandy loam or loam. Reaction is slightly acid or neutral.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma 4 to 6. Redoximorphic features in shades of yellow or brown range from none to common and from faint to distinct. Texture is sandy clay loam, clay loam, or clay. Reaction ranges from slightly acid to slightly alkaline.

The BCt horizon has hue of 7.5YR or 10YR, values of 4 to 6, and chroma of 4 to 6. Redoximorphic features in shades of yellow, brown, gray, or white range from none to common and from faint to distinct. Texture is sandy clay loam or clay loam. Reaction ranges from neutral to moderately alkaline.

Bastrop Series

The Bastrop series is very deep, very gently or gently sloping, well drained soils on treads on stream terraces. These soils are moderately permeable. They formed in loamy alluvium. Slope ranges from 1 to 5 percent. The soils of the Bastrop series are fine-loamy, mixed, active, thermic Udic Paleustalfs.

Typical pedon of Bastrop fine sandy loam, 1 to 3 percent slopes; from the intersection of Interstate Highway 20 and U.S. Highway 281 in Mineral Wells, north on U.S. Highway 281 to the west end of the Brazos River bridge, and 0.8 mile north-northeast on U.S. Highway 281. Site is west of the highway and 60 feet from a fence.

- A1—0 to 10 inches; brown (7.5YR 5/4) fine sandy loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; slightly hard, friable; many fine and common medium roots; common very fine pores; few medium rounded siliceous pebbles; slightly acid; abrupt smooth boundary.
- A2—10 to 13 inches; reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; weak medium and fine subangular blocky structure; slightly hard, friable; many fine and few medium roots; common very fine pores; few mole burrows up to 2.5 inches in diameter; few fine wormcasts; few medium rounded siliceous pebbles; slightly acid; clear wavy boundary.
- Bt1—13 to 20 inches; reddish brown (5YR 4/4) sandy clay loam, reddish brown (5YR 4/4) moist; strong coarse prismatic structure parting to moderate medium subangular blocky; hard, friable; many fine and few medium roots; many very fine pores; common thin clay films on surfaces of peds; many fine wormcasts; few worm nests and holes filled with slightly darker soil; few medium rounded siliceous pebbles; neutral; gradual wavy boundary.
- Bt2—20 to 30 inches; yellowish red (5YR 4/6) sandy clay loam, yellowish red (5YR 4/6) moist; strong coarse prismatic structure parting to moderate medium subangular blocky; hard, firm; many fine roots; few medium roots; many very fine and fine pores; common distinct dark reddish brown (5YR 3/4) clay films on surfaces of peds; many fine wormcasts; few krotovinas as much as 0.5 inch in diameter; few medium rounded siliceous pebbles; neutral; gradual wavy boundary.
- Bt3—30 to 50 inches; yellowish red (5YR 4/6) sandy clay loam, yellowish red (5YR 4/6) moist; strong coarse prismatic structure parting to moderate medium subangular blocky; hard, firm; common fine and few medium roots; many very fine and fine pores; common distinct reddish brown (5YR 4/4) clay films on surfaces of peds; many fine and very fine wormcasts; few medium rounded siliceous pebbles; neutral; gradual wavy boundary.
- Bt4—50 to 72 inches; yellowish red (5YR 5/6) sandy clay loam, yellowish red (5YR 4/6) moist; moderate coarse prismatic structure parting to moderate medium and

coarse subangular blocky; hard, firm; few fine roots; many very fine and few fine pores; common distinct clay films on surfaces of peds; common fine wormcasts; few medium rounded and angular siliceous pebbles; neutral; clear wavy boundary. Btk—72 to 80 inches; yellowish red (5YR 5/8) sandy clay loam, yellowish red (5YR 4/6) moist; weak coarse prismatic structure parting to moderate medium and coarse subangular blocky; hard, friable; few fine roots; common very fine and fine pores; few very fine wormcasts; few faint clay films on surfaces of peds; few films and threads of calcium carbonate on surfaces of peds; few medium rounded siliceous pebbles and few fragments of calcareous sandstone; strongly effervescent; neutral.

The solum thickness ranges from 60 to more than 80 inches. Small siliceous pebbles range from none to 3 percent by volume throughout. Average clay content of the control section ranges from 20 to 35 percent.

The A horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 3 to 6. Texture is loamy fine sand or fine sandy loam. Reaction ranges from slightly acid to slightly alkaline.

The Bt and Btk horizons have hue of 2.5YR or 5YR, value of 4 to 6, and chroma of 4 to 8. Texture is sandy clay loam or loam. Reaction ranges from slightly acid to moderately alkaline.

The BC and C horizons, where present, have hue of 5YR or 7.5YR, value of 5 to 7, and chroma of 4 to 8. Texture is sandy clay loam or clay loam. Some pedons have secondary calcium carbonate in the form of films, threads and concretions.

Bluegrove Series

The Bluegrove series is moderately deep over sandstone bedrock. This very gently sloping, well drained soil is on summits of ridges. These soils are moderately slowly permeable. They formed in materials weathered from sandstone and claystone. Slope ranges from 1 to 3 percent. The soils of the Bluegrove series are fine, mixed, active, thermic Typic Haplustalfs (fig. 9).

Typical pedon of Bluegrove fine sandy loam, 1 to 3 percent slopes; from the intersection of Texas Highway 16 and Farm Road 1769 in Markley, 1.9 miles south on Texas Highway 16, 2.5 miles east southeast on Stewart Ranch road, 0.7 mile south, and 50 feet east in rangeland.

A—0 to 5 inches; brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 3/4) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, friable; many fine and medium roots, common very fine and fine pores; few wormcasts; neutral; clear smooth boundary.

Bt1—5 to 9 inches; reddish brown (5YR 5/4) sandy clay loam, dark reddish brown (5YR 3/4) moist; moderate medium and coarse prismatic structure parting to weak fine and medium subangular blocky; hard, firm; common fine and medium roots; common fine and medium pores; few distinct clay films on surfaces of peds; few sandstone fragments; neutral; clear smooth boundary.

Bt2—9 to 19 inches; reddish brown (2.5YR 4/4) clay, dark reddish brown (2.5YR 3/4) moist; moderate coarse prismatic structure parting to moderate fine and medium subangular blocky; very hard, very firm; common very fine and fine roots; common fine and medium tubular pores; common distinct clay films on surfaces of peds; few pressure faces; few ferro-manganese concretions; neutral; clear smooth boundary.

Bt3—19 to 29 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; moderate coarse prismatic structure parting to moderate medium and coarse subangular blocky; very hard, very firm; common very fine, fine, and few coarse roots; common very fine and fine pores; common distinct clay films on surfaces of peds; few fine slickensides and pressure faces; common medium faint yellowish

red (5YR 4/6) masses of oxidized iron; 1 to 2 percent ferro-manganese concretions and stains; neutral; clear smooth boundary.

BCt—29 to 34 inches; reddish brown (2.5YR 4/4) paragravelly clay, dark reddish brown (2.5YR 3/4) moist; weak coarse prismatic structure parting to weak fine and medium subangular blocky; very hard, very firm; common very fine and fine roots; common very fine and fine pores; common distinct clay films on surfaces of peds; common medium distinct dark red (2.5YR 3/6), red (2.5YR 4/8) and light yellowish brown (10YR 6/4) masses of oxidized iron; common fine and medium ferro-manganese stains; coarse sandstone fragments range up to 30 percent by volume; neutral; clear smooth boundary.

Cr—34 to 60 inches; very pale brown (10YR 7/3), pale brown (10YR 6/3) moist; fractured sandstone bedrock with thin (0.5 inch) fracture zones filled with soil material of fine sandy loam; common very fine and fine roots penetrate these areas; soil material is dark red (2.5YR 3/6) moist; sandstone is very fine and fine grained.

The solum thickness and depth to sandstone bedrock ranges from 20 to 40 inches. Clay content of the control section ranges from 35 to 50 percent clay.

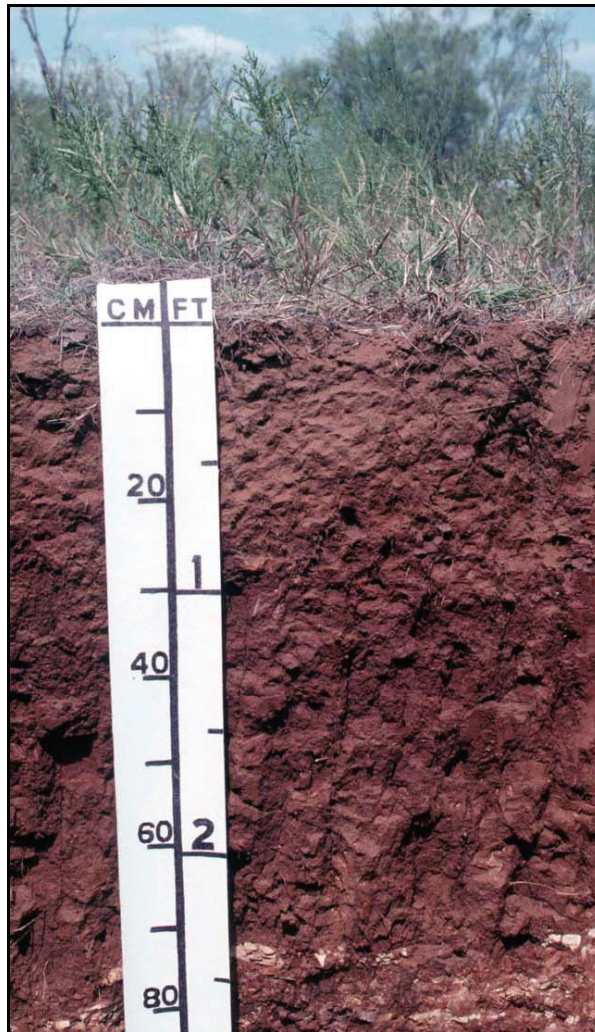


Figure 9.—Profile of Bluegrove fine sandy loam, 1 to 3 percent slopes. A paralithic contact is at a depth of 34 inches (86 centimeters).

The A horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. Texture is fine sandy loam or loam. Coarse fragments range from 0 to 15 percent by volume of flaggy sandstone in the surface horizon. Reaction is slightly acid or neutral.

The Bt and BCt horizons have hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 3 to 6. Reaction ranges from slightly acid to moderately alkaline. Texture of the upper Bt horizon is sandy clay loam, sandy clay, clay loam, or clay and the lower Bt horizons are clay and clay loam. Sandstone parafragments range from 0 to 30 percent by volume in the lower Bt.

The Cr horizon is weakly to moderately cemented, thinly bedded sandstone interbedded with claystone in some pedons.

Bonti Series

The Bonti series is moderately deep over sandstone bedrock. This very gently sloping, well drained soil is on summits on ridges. These soils are moderately slowly permeable. They formed in residuum of interbedded sandstone and claystone bedrock. Slope ranges from 1 to 3 percent. The soils of the Bonti series are fine, mixed, active thermic, Ultic Paleustalfs.

Typical pedon of Bonti fine sandy loam, 1 to 3 percent slopes; from the intersection of Texas Highway 380 and Farm Road 2179 in Graham, 7.1 miles east on Texas Highway 380, 1.0 mile north on Farm Road 2075, 3.3 miles northwest on ranch road, and 110 feet north in rangeland.

A—0 to 3 inches; brown (10YR 5/3) fine sandy loam; dark brown (10YR 3/3) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, very friable; many fine and medium roots; common fine pores; 1 to 3 percent by volume sandstone pebbles; neutral; clear smooth boundary.

E—3 to 8 inches; light brown (7.5YR 6/4) fine sandy loam; brown (7.5YR 5/4) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, very friable; many fine and medium roots; common fine pores; 1 to 3 percent by volume sandstone pebbles; neutral; clear smooth boundary.

Bt1—8 to 18 inches; red (2.5YR 5/6) sandy clay; red (2.5YR 4/6) moist; moderate coarse prismatic structure parting to moderate fine and medium subangular blocky; very hard, firm; few fine and medium roots, few fine and medium pores; few distinct clay films on surfaces of peds; few fine distinct light brown (7.5YR 6/4) masses of oxidized iron; moderately acid; clear smooth boundary.

Bt2—18 to 26 inches; reddish yellow (5YR 6/6) sandy clay; yellowish red (5YR 5/6) moist; moderate coarse prismatic structure parting to moderate fine and medium subangular blocky; very hard, firm; few fine and medium roots, few fine and medium pores; common distinct clay films on surfaces of peds; few fine faint reddish yellow (7.5YR 6/6) masses of oxidized iron; few fine prominent light brownish gray (10YR 6/2) iron depletions; moderately acid; clear smooth boundary.

Cr—26 to 40 inches; moderately cemented sandstone bedrock.

The solum thickness and depth to bedrock ranges from 20 to 40 inches. Clay content of the control section ranges from 35 to 45 percent.

The A horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4.

The E horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 to 6. Reaction ranges from moderately acid to neutral.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 to 6, and chroma of 4 or 6. Typically, there are a few mottles with colors of red, yellow, or brown in the lower part. Texture is clay loam, sandy clay, or clay. Reaction is strongly acid or moderately acid. The base saturation percentages range from 50 to 75 percent.

The Cr horizon is weakly to moderately cemented sandstone bedrock.

Callahan Series

The Callahan series is moderately deep over dense clay or claystone bedrock. This gently sloping, well drained soil is on backslopes on ridges. These soils are slowly permeable. They formed in residuum from claystone bedrock interbedded with thin noncemented sandstone strata. Slope ranges from 2 to 5 percent. The soils of the Callahan series are fine, mixed, active, thermic, Typic Haplustalfs.

Typical pedon of Callahan loam 2 to 5 percent slopes, moderately eroded; from the intersection of Farm Road 926 and Farm Road 251 in Newcastle, 6.7 miles north on Farm Road 251, 2.25 miles west on county road, 0.75 mile north, 2.8 miles west, and 0.2 mile northeast in field.

Ap—0 to 5 inches; brown (7.5YR 4/4) loam, dark brown (7.5YR 3/4) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, firm; common fine roots; common fine and medium pores; moderately alkaline; clear smooth boundary.

Bt—5 to 17 inches; brown (7.5YR 4/4) clay, dark brown (7.5YR 3/4) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, very firm; few fine roots; few fine pores; common distinct clay films on surfaces of peds; 5 percent ferro-manganese concretions; 5 percent sandstone fragments; moderately alkaline; clear smooth boundary.

Btk—17 to 34 inches; yellow (10YR 7/6) clay, brownish yellow (10YR 6/6) moist; common medium distinct light yellowish brown (10YR 6/4) and (2.5Y 6/4) mottles; moderate medium subangular blocky structure; very hard, very firm; few very fine roots; few fine pores; few faint clay films on surfaces of peds; few ferro-manganese concretions; few films, threads, and masses of calcium carbonate; moderately alkaline; gradual smooth boundary.

Cd1—34 to 50 inches white (5Y 8/1) dense clay, light gray (5Y 7/1) moist; few medium distinct pale yellow (2.5Y 7/4), and yellow (2.5Y 8/6) mottles; massive; common ferro-manganese concretions; few films, threads, and masses of calcium carbonate; common sandstone fragments; moderately alkaline; clear smooth boundary.

Cd2—50 to 60 inches; pale yellow (2.5Y 8/4) claystone bedrock that slakes in water, pale yellow (2.5Y 7/4) moist; massive; few fine distinct light olive brown (2.5Y 5/4) mottles, and common medium distinct pale yellow (5Y 7/3) mottles; few films, threads, and masses of calcium carbonate and gypsum; common sandstone fragments; moderately alkaline; clear smooth boundary.

Cd3—60 to 64 inches; noncemented sandstone.

The solum thickness ranges from 24 to 40 inches. Calcium carbonate in the form of films, threads, soft bodies, and concretions occur at depths of 18 to 28 inches below the surface. Coarse fragments of siliceous pebbles, sandstone fragments, and concretions range from 2 to 10 percent by volume. Reaction ranges from neutral to moderately alkaline in the A and upper Bt horizons and from slightly to moderately alkaline in the lower part of the solum.

The A horizon has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 3 or 4. Soils with value and chroma of less than 3.5 have A horizons less than 8 inches thick.

The Bt, Btk, and Btk/C horizons have hue of 5YR to 10YR, value of 4 to 7, and chroma of 3 to 6. Texture is clay loam or clay. Clay content ranges from 35 to 50 percent.

The Cd horizons of dense clay or claystone bedrock are commonly interbedded with thin strata of sandstone and alkaline loamy or clayey sediments.

Chaney Series

The Chaney series is deep over dense clay or claystone bedrock. This nearly level to very gently sloping, moderately well drained soil is on treads on strath terraces. These soils are slowly permeable. They formed in sandy and clayey residuum from claystone and sandstone. Slope ranges from 0 to 3 percent. The soils of the Chaney series are fine, mixed, active thermic Oxyaquic Paleustalfs.

Typical pedon of Chaney loamy fine sand, 0 to 3 percent slopes; from the intersection of Texas Highway 16 and Farm Road 2652 in Graham, 10.4 miles north on Farm Road 2652, 0.1 mile west on Texas Highway 114, 1.4 miles east on Carker road, and 175 feet south in rangeland.

Ap—0 to 6 inches; brown (7.5YR 5/4) loamy fine sand, dark brown (7.5YR 3/4) moist; weak fine granular structure; soft, very friable; common fine and medium roots; common fine and medium pores; neutral; clear smooth boundary.

A2—6 to 12 inches; brown (7.5YR 5/4) fine sandy loam, brown (7.5YR 4/4) moist; weak fine and medium granular structure; slightly hard, friable; common fine and medium roots; common fine and medium pores; neutral; gradual smooth boundary.

Bt1—12 to 22 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist, moderate fine and medium subangular blocky; hard, firm; few fine roots and pores; common distinct clay films on surfaces of peds; few pockets of fine sandy loamy material in cracks; many medium prominent reddish yellow (7.5YR 7/6), many fine prominent red (2.5YR 5/6) masses of oxidized iron; few fine moderately cemented ferro-manganese nodules throughout; the ferro-manganese nodules are relict redoximorphic features; neutral; gradual smooth boundary.

Bt2—22 to 46 inches; yellow (10YR 7/6) clay, brownish yellow (10YR 6/6) moist; moderate medium angular blocky structure parting to weak fine subangular blocky; hard, firm; few fine roots; common faint clay films on surfaces of peds; common pockets of fine sandy loam material in cracks; common fine prominent red (2.5YR 5/6), common fine faint yellowish brown (10YR 5/4) masses of oxidized iron; many medium prominent light brownish gray (10YR 6/2) iron depletions; common fine strongly cemented ferro-manganese concretions with sharp boundaries; the brownish gray colors and ferro-manganese accumulations are relict redoximorphic features; 2 percent sandstone fragments; neutral; clear smooth boundary.

BCtk—46 to 57 inches; yellowish red (10YR 5/6) clay, yellowish red (10YR 4/6) moist; many medium prominent light gray (2.5Y 7/2), many medium distinct reddish yellow (7.5YR 7/6) mottles; moderate medium angular blocky structure; hard, firm; few faint clay films on surfaces of peds; 10 percent calcium carbonate concretions and soft masses; common fine strongly cemented ferro-manganese concretions with sharp boundaries; the light gray and iron accumulations are relict redoximorphic features; moderately alkaline; clear smooth boundaries.

Cd—57 to 80 inches; pale olive (5Y 6/4) dense clay, olive (5Y 5/4) moist; few fine prominent red (2.5YR 5/6) and, few fine faint light gray (5Y 7/1) mottles; massive; 5 percent concretions of calcium carbonate; moderately alkaline;

The solum range from 40 to 60 inches thick over dense clay or claystone bedrock.

The A horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 3 or 4. The E horizon is 1 to 3 units higher in value than the A horizon. Texture of the A and E horizons is loamy fine sand or fine sandy loam. However, the E horizon may be absent where plowing has mixed the A and E horizons. Reaction ranges from moderately acid to neutral.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 4 to 8. Most pedons have relic redoximorphic features with colors in shades of gray or grayish brown.

Texture is sandy clay or clay. Clay content ranges from 35 to 50 percent. Reaction ranges from moderately acid to neutral.

The BC horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 to 6. Mottles have hue of 2.5YR to 5Y, value of 4 to 7, and chroma of 1 to 6. Texture is sandy clay loam, sandy clay, or clay. Fragments of sandstone, chert, and ironstone range from 0 to 3 percent by volume. Reaction ranges from moderately acid to moderately alkaline.

The Cd horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 to 6. Mottles have hue of 2.5YR to 5Y, value of 4 to 7, and chroma of 1 to 6. Texture is claystone or clay interbedded with loamy soil material. Some pedons have weakly cemented layers of sandstone. Some pedons contain a few films, threads, or masses of calcium carbonate. Reaction ranges from moderately acid to moderately alkaline and calcareous.

Clearfork Series

The Clearfork series is very deep, nearly level, well drained soils on flood plains. These soils are moderately slowly permeable. They formed in calcareous loamy and clayey alluvium. Slope ranges from 0 to 1 percent. The soils of the Clearfork series are fine-silty, mixed, active, thermic Cumulic Haplustolls.

Typical pedon of Clearfork silty clay loam, 0 to 1 percent slopes, occasionally flooded; from the intersection of U.S. Highway 180 and U.S. Highway 183 in Breckenridge, 12.9 miles northwest on U.S. Highway 183, 4.6 miles west on county road, 0.8 mile north-northeast on a range trail, and 30 feet south in rangeland.

A1—0 to 4 inches; reddish brown (5YR 4/3) silty clay loam, dark reddish brown (5YR 3/3) moist; moderate coarse subangular blocky structure; very hard, very firm, very sticky and plastic; many fine roots; many fine pores; many wormcasts; dry weather cracks 0.5 inch wide; strongly effervescent; moderately alkaline; clear smooth boundary.

A2—4 to 17 inches; reddish brown (5YR 5/3) silty clay loam, dark reddish brown (5YR 3/3) moist; moderate fine and medium subangular blocky structure; very hard, very firm, very sticky and plastic; many fine roots; common pores; common wormcasts; dry weather cracks 2 to 3 inches wide; few threads and films of calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.

A3—17 to 28 inches; dark reddish gray (5YR 4/2) silty clay loam; dark reddish brown (5YR 3/2) moist; moderate medium and coarse subangular blocky structure; very hard, very firm, very sticky and plastic; common fine roots; common fine pores; few wormcasts; few films and threads of calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.

Bw1—28 to 59 inches; reddish brown (5YR 4/4) silty clay loam, dark reddish brown (5YR 3/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; common fine roots; common fine pores; common wormcasts; few films and threads of calcium carbonate; few thin lenses of silt loam; violently effervescent; moderately alkaline; clear smooth boundary.

Bw2—59 to 76 inches; reddish brown (5YR 5/4) silty clay loam, reddish brown (5YR 4/4) moist; weak fine and medium subangular blocky structure; hard, firm, sticky and plastic; common fine and medium roots; many fine tubular pores; few wormcasts; few broken shell fragments; few threads of calcium carbonate; few thin discontinuous lenses of silt loam; violently effervescent; moderately alkaline; clear smooth boundary.

Bw3—76 to 80 inches; reddish brown (5YR 5/4) silty clay loam; reddish brown (5YR 4/4) moist; weak fine subangular blocky structure; hard, firm, sticky and plastic; few fine roots; many fine tubular pores; few wormcasts; few films and threads of calcium carbonate; violently effervescent; moderately alkaline.

The mollic epipedon is 20 to 40 inches thick. Linear extensibility percent ranges from 0.035 to 0.065. Total clay content in the control section ranges from 29 to 44 percent. Silicate clay content in the control sections range from 28 to 35 percent. Reaction is moderately alkaline throughout.

The A horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 2 or 3. Texture is silty clay loam or silty clay. Dry-weather cracks from less than 0.5 inch wide occur in most pedons. Calcium carbonate equivalent is 0 to 13 percent.

The Bw or Bk horizons have hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 4 or 6. Texture is silty clay loam or silty clay that contains films and threads of calcium carbonate. Most pedons have thin discontinuous stratas or lenses of loam, silt loam, or silty clay loam. Calcium carbonate equivalent is 5 to 15 percent.

Deandale Series

The Deandale series is very deep, nearly level to very gently sloping, moderately well drained soil on treads on stream terraces. These soils are very slowly permeable. They formed in clayey alluvium. Slope ranges from 0 to 2 percent. The soils of the Deandale series are fine, smectitic, thermic Pachic Paleustolls.

Typical pedon of Deandale loam, 0 to 2 percent slopes; from the intersection of Farm Road 926 and Farm Road 251 in Newcastle, 8.7 miles north on Farm Road 251, 0.4 mile east, and 60 feet south in cropland.

Ap—0 to 9 inches; brown (7.5YR 4/3) loam, dark brown (7.5YR 3/3) moist; weak fine subangular blocky structure parting to weak fine granular; hard, firm; common fine roots; common fine pores; neutral; clear smooth boundary.

A2—9 to 18 inches; brown (7.5YR 4/2) loam, dark brown (7.5YR 3/2) moist; weak fine subangular blocky structure; hard, firm; common fine roots; common fine pores; neutral; gradual smooth boundary.

Bt—18 to 27 inches; dark grayish brown (10YR 4/2) clay; very dark grayish brown (10YR 3/2) moist; moderate medium and coarse subangular blocky structure; very hard, very firm; sticky and plastic; few fine roots; few fine pores; few pressure faces; common distinct clay films on surfaces of peds; slightly alkaline; gradual smooth boundary.

Btk1—27 to 40 inches; brown (10YR 5/3) clay; brown (10YR 4/3) moist; moderate medium and coarse subangular blocky structure; very hard, very firm; few fine roots; common distinct clay films on surfaces of peds; few pressure faces; 8 percent calcium carbonate films, threads, soft masses and concretions; strongly effervescent; moderately alkaline; gradual smooth boundary.

Btk2—40 to 58 inches; grayish brown (10YR 5/2) clay; dark grayish brown (10YR 4/2) moist; moderate medium and coarse subangular blocky structure; very hard, very firm; few fine roots; common distinct clay films on surfaces of peds; few pressure faces; 7 percent calcium carbonate films, threads, soft masses, and concretions; few ferro-manganese concretions; strongly effervescent; moderately alkaline; gradual smooth boundary.

Btk3—58 to 70 inches; grayish brown (10YR 5/2) clay; dark grayish brown (10YR 4/2) moist; moderate medium and coarse subangular blocky structure; very hard, very firm; few very fine roots; few faint clay films on surfaces of peds; few pressure faces; 8 percent films, threads, soft masses, and concretions of calcium carbonate; few ferro-manganese concretions; common fine faint dark gray (10YR 4/1) irregularly shaped iron depletions with clear boundaries in matrix; iron depletions are with concentrations; strongly effervescent; moderately alkaline; gradual smooth boundary.

Btk4—70 to 80 inches; light gray (2.5Y 7/2) clay; light brownish gray (2.5Y 6/2) moist; weak medium and coarse subangular blocky structure; very hard, very firm; few

very fine roots; few faint clay films on surfaces of peds; few pressure faces; 7 percent calcium carbonate films, threads, soft masses, and concretions; slightly effervescent; few ferro-manganese concretions; common fine faint pale yellow (2.5Y 7/3), and few fine distinct yellow (10YR 7/8) irregularly shaped iron masses with clear boundaries in the matrix; moderately alkaline; iron depletions and masses are with concentrations.

The solum thickness ranges from 60 to more than 80 inches. Depth to secondary carbonates range from 12 to 28 inches. Clay content of the control section ranges from 35 to 45 percent clay. Carbonates occur in the form of threads and films to masses and concretions of calcium carbonates.

The A horizon has hue of 7.5YR or 10YR, value of 4, and chroma of 2 or 3. Reaction ranges from slightly acid to moderately alkaline.

The Bt horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 or 3. Texture is clay loam or clay with clay content of 35 to 45 percent. Reaction ranges from neutral to moderately alkaline and typically is noncalcareous.

The Btk horizons have hue of 7.5YR to 2.5Y, value of 3 to 7, and chroma of 2 to 6. Texture is clay loam or clay. Carbonates range from 3 to 10 percent by volume. Reaction is slightly alkaline or moderately alkaline.

Decordova Series

The Decordova series is very deep, nearly level or very gently sloping, well drained soils on treads on stream terraces of the Brazos River. These soils are moderately rapidly permeable. They formed in sandy and loamy alluvium. Slope ranges from 0 to 3 percent. The soils of the Decordova series are coarse-loamy, siliceous, active, thermic Udic Paleustalfs.

Typical pedon of Decordova loamy fine sand, 0 to 3 percent slopes; from the intersection of Farm Road 251 and U.S. Highway 380 in Newcastle, 1.4 miles south on Farm Road 251, 528 feet west, and 30 feet north in cropland.

- Ap—0 to 14 inches; light brown (7.5YR 6/4) loamy fine sand, dark brown (7.5 YR 4/4) moist; single grain; soft, very friable; few fine roots; few fine pores; neutral; clear smooth boundary.
- Bt1—14 to 32 inches; light reddish brown (5YR 6/4) fine sandy loam, reddish brown (5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable; few fine roots; clay bridges between sand grains, and few faint clay films on surfaces of peds; slightly alkaline; gradual smooth boundary.
- Bt2—32 to 50 inches; yellowish red (5YR 5/6) fine sandy loam, yellowish red (5YR 4/6) moist; weak fine and medium subangular blocky structure parting to weak medium granular; slightly hard, very friable; few distinct clay films on surfaces of peds; slightly alkaline; gradual smooth boundary.
- Bt3—50 to 80 inches; yellowish red (5YR 5/6) fine sandy loam; yellowish red (5YR4/6) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, very friable; few distinct clay films on surfaces of peds; noncalcareous; moderately alkaline.

The solum thickness is more than 60 inches.

The A horizon has hue of 7.5YR, value of 4 to 6, and chroma of 4. Reaction is slightly acid or neutral.

The Bt horizon has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 4 or 6. Clay content in the control section ranges from 8 to 17 percent. Some pedons contain streaks and pockets of uncoated sand in the lower part. Reaction ranges from slightly acid to moderately alkaline.

Enterprise Series

The Enterprise series is very deep, very gently sloping or gently sloping, well drained soils on treads on stream terraces of the Brazos River. These soils are moderately rapidly permeable. They formed in loamy eolian sediments. Slope ranges from 1 to 5 percent. The soils of the Enterprise series are coarse silty, mixed, superactive, thermic Typic Haplustepts.

Typical pedon of Enterprise very fine sandy loam, 1 to 3 percent slopes; from the intersection of Farm Road 2998 and Texas Highway 79 in Padgett, 2.1 miles west on Farm Road 2998, 0.5 mile north on county road, and 300 feet west in rangeland.

A—0 to 9 inches; reddish brown (5YR 4/4) very fine sandy loam, dark reddish brown (5YR 3/4) moist; weak fine and medium subangular blocky structure parting to weak fine and medium granular; friable; common fine and medium roots; common fine and medium pores; common wormcasts; slightly alkaline; gradual smooth boundary.

Bk1—9 to 18 inches; yellowish red (5YR 5/6) very fine sandy loam, red (5YR 4/6) moist; weak medium and coarse prismatic structure parting to weak fine and medium subangular blocky; friable; common fine roots; common fine and medium pores; common wormcasts; slightly effervescent; moderately alkaline; gradual smooth boundary.

Bk2—18 to 42 inches; yellowish red (5YR 5/6) loam, yellow red (5YR 4/6) moist; weak medium and coarse prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable; common very fine and fine roots; common fine pores; common wormcasts; 10 to 15 percent films, threads, and masses of calcium carbonate; violently effervescent; moderately alkaline; gradual smooth boundary.

Bk3—42 to 60 inches; reddish yellow (5YR 6/6) very fine sandy loam; yellowish red (5YR 4/6) moist; weak medium and coarse prismatic structure parting to weak fine and medium subangular blocky; common fine and very fine roots; common fine pores; common wormcasts; 10 to 15 percent films, threads, and masses of calcium carbonate; violently effervescent; moderately alkaline; gradual smooth boundary.

Bck—60 to 80 inches; red (2.5YR 5/6) very fine sandy loam; red (2.5YR 4/6) moist; weak fine and medium subangular blocky structure parting to weak fine and medium granular; friable; 2 percent films and threads of calcium carbonate; strongly effervescent; moderately alkaline; gradual smooth boundary.

The solum thickness ranges from 60 to more than 80 inches. Depth to secondary carbonates ranges from 0 to 30 inches. Texture is very fine sandy loam, loam, or silt loam.

The A horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. Reaction ranges from neutral to moderately alkaline.

The Bw, Bk, and Bck horizons have hue of 2.5YR to 7.5YR, value of 5 or 6, and chroma of 4 or 6. Reaction is slightly alkaline or moderately alkaline.

Exray Series

The Exray series is shallow over sandstone bedrock. This undulating, well drained soil is on shoulders on ridges. These soils are moderately slowly permeable. They formed in residuum of weathered sandstone interbedded with clay. Slope ranges from 1 to 8 percent. The soils of the Exray series are fine, mixed, active, thermic, shallow Typic Haplustalfs.

Typical pedon of Exray extremely stony fine sandy loam, in an area of Exray-Loving complex, 1 to 8 percent slopes, extremely stony; from the intersection of Texas Highway 16 and Texas Highway 114 in Loving, 5.7 miles north on Texas Highway 16, 3.0 miles east and southeast on Stewart Ranch road, and 60 feet south of county road in rangeland.

A—0 to 5 inches; brown (7.5YR 5/4) very stony fine sandy loam, brown (7.5YR 4/4) moist; weak fine granular structure; slightly hard, friable; common fine roots; common fine pores; 5 percent of the surface is covered with stones and boulders up to 5 feet across and 10 feet long with the upper 1 inch containing pebbles of sandstone; neutral; clear smooth boundary.

Bt—5 to 12 inches; yellowish red (5YR 4/6) clay loam, yellowish red (5YR 4/6) moist; moderate fine and medium angular blocky structure; very hard, very firm, sticky and plastic; common fine and medium roots, few fine pores; many distinct clay films on surfaces of peds; few fragments of sandstone; few wormcasts; slightly acid; abrupt wavy boundary.

Cr—12 to 20 inches; red (2.5YR 5/6), and red (2.5YR 4/8) moderately cemented sandstone; fractures extend deeply into horizon and are filled with red clayey soil material and roots.

The solum thickness ranges from 10 to 20 inches. Volume of coarse fragments of gravel to stone-size range from few to 15 percent in the surface layer.

The A horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6. Reaction is slightly acid or neutral.

The Bt horizon has hue of 2.5YR or 5YR, value of 3 to 6, and chroma of 4 to 8. Texture is sandy clay or clay. Clay content ranges from 35 to 50 percent. Reaction is moderately acid or slightly acid.

The Cr is weakly to moderately cemented sandstone. Fractures are typically 6 to 20 inches apart.

Gageby Series

The Gageby series is very deep, nearly level or very gently sloping, well drained soils on flood plains. These soils are moderately permeable. They formed in loamy alluvium along local streams. Slope ranges from 0 to 2 percent, but are dominantly 0.5 percent. The soils of the Gageby series are fine-loamy, mixed, superactive thermic Cumulic Haplustolls.

Typical pedon of Gageby loam, 0 to 2 percent slopes, occasionally flooded; from the intersection of U.S. Highway 283 in Throckmorton, 7.9 miles east on U.S. Highway 380, 0.8 mile south, 0.3 mile west, and 80 feet south in rangeland.

A1—0 to 12 inches, brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky and granular structure; hard, friable; common fine roots; common fine and medium pores; moderately alkaline; clear smooth boundary.

A2—12 to 22 inches, brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky and granular structure; hard, friable; common fine roots; common very fine pores; 5 percent very fine calcium carbonate concretions; slightly effervescent; moderately alkaline; clear smooth boundary.

Bk1—22 to 34 inches, brown (10YR 5/3) loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; hard, friable; common fine roots; common medium to very fine pores; 5 percent very fine calcium carbonate concretions; slightly effervescent; moderately alkaline; clear smooth boundary.

Bk2—34 to 58 inches, brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, friable; few fine roots; common fine pores; 5 percent very fine concretions of calcium carbonate; slightly effervescent; moderately alkaline.

BCK—58 to 80 inches, yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; massive; hard, friable; few very fine roots; few threads and films of calcium carbonate; thin lenses of fine sandy loam and silt loam materials on exterior of peds; slightly effervescent; moderately alkaline.

The solum thickness is more than 60 inches. The mollic epipedon is 20 to 40 inches thick. Depth to secondary carbonates is 0 to 25 inches. Texture of the 10- to 40-inch control section is loam, sandy clay loam, or clay loam with a clay content of 18 to 35 percent. Reaction is moderately alkaline and calcareous, or slightly alkaline and noncalcareous above 25 inches. Below 25 inches the reaction is moderately alkaline and calcareous.

The A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 or 3.

The Bk and BCK horizons have hue of 5YR to 10YR, value of 4 to 6, and chroma of 2 to 6. Texture is loam, silty clay loam, sandy clay loam, or clay loam. Calcium carbonate in the form of threads, films, and concretions ranges from 5 to 10 percent.

Goodnight Series

The Goodnight series is very deep, gently sloping to moderately steep, excessively drained soils on dunes adjacent to flood plains of the Brazos River. These soils are rapidly permeable. They formed in sandy eolian sediments of recent age. Slope ranges from 3 to 20 percent. The soils of the Goodnight series are mixed, thermic, Typic Ustipsammments.

Typical pedon of Goodnight loamy fine sand, 3 to 20 percent slopes; from the intersection of Farm Road 209 and Texas Highway 67 south of Graham, 6.1 miles west on Farm Road 209, 1.65 miles west on Pink Brooks road, 1.1 miles southwest on Ranch road, 45 feet east in rangeland.

A—0 to 18 inches; brown (7.5YR 5/4) loamy fine sand, brown (7.5YR 4/4) moist; weak fine granular and single grain structure; loose, very friable; common fine and medium roots; few fine pores; slightly alkaline; gradual smooth boundary.

C1—18 to 40 inches; reddish yellow (7.5YR 6/6) fine sand, strong brown (7.5YR 5/6) moist; single grain; loose; few fine and medium roots; very slightly effervescent; moderately alkaline; gradual smooth boundary.

C2—40 to 80 inches; reddish yellow (7.5YR 7/6) fine sand, reddish yellow (7.5YR 6/6) moist; single grain; loose; few fine and medium roots; very slightly effervescent; moderately alkaline.

The solum thickness is more than 60 inches. Texture is fine sand or loamy fine sand. The soil is commonly noncalcareous in the upper 40 inches, but ranges to calcareous throughout.

The A horizon has hue of 7.5YR, value of 4 to 6, and chroma of 3 or 4. Reaction is slightly alkaline or moderately alkaline.

The C1 horizon has hue of 7.5YR, value of 5 to 7, and chroma of 4 or 6. Reaction is slightly alkaline or moderately alkaline.

The C2 horizon has hue of 5YR or 7.5YR, value of 5 to 8, and chroma of 6 or 8. Reaction is slightly alkaline or moderately alkaline.

Gowen Series

The Gowen series is very deep, nearly level, well drained soils on flood plains. These soils are moderately permeable. They formed in loamy alluvium along local streams. Slope ranges from 0 to 1 percent. The soils of the Gowen series are fine-loamy, mixed, superactive thermic Cumulic Haplustolls. (Fig. 10)

Typical pedon of Gowen loam, 0 to 1 percent slopes, occasionally flooded; from the intersection of Texas Highway 16 and U.S. Highway 380 in Graham, 7.0 miles north on Texas Highway 16, 0.2 mile southeast on county road, and 25 feet north in rangeland.

A1—0 to 4 inches; very dark grayish brown (10YR 3/2) loam, very dark brown (10YR 2/2) moist; moderate fine subangular blocky structure parting to moderate fine

granular; hard, friable; many very fine, fine, and common medium roots; common fine, medium, and few coarse pores; neutral; clear smooth boundary.

A2—4 to 12 inches; very dark grayish brown (10YR 3/2) loam, very dark brown (10YR 2/2) moist; moderate fine and medium subangular blocky structure; hard, friable; many very fine, fine, and common medium roots; common very fine and medium and few coarse pores; neutral; clear smooth boundary.

A3—12 to 23 inches; very dark grayish brown (10YR 3/2) loam, very dark brown (10YR 2/2) moist; moderate fine and medium subangular blocky structure; hard, friable; common very fine, fine, and common medium roots; common fine, medium and few large pores; neutral; gradual smooth boundary.

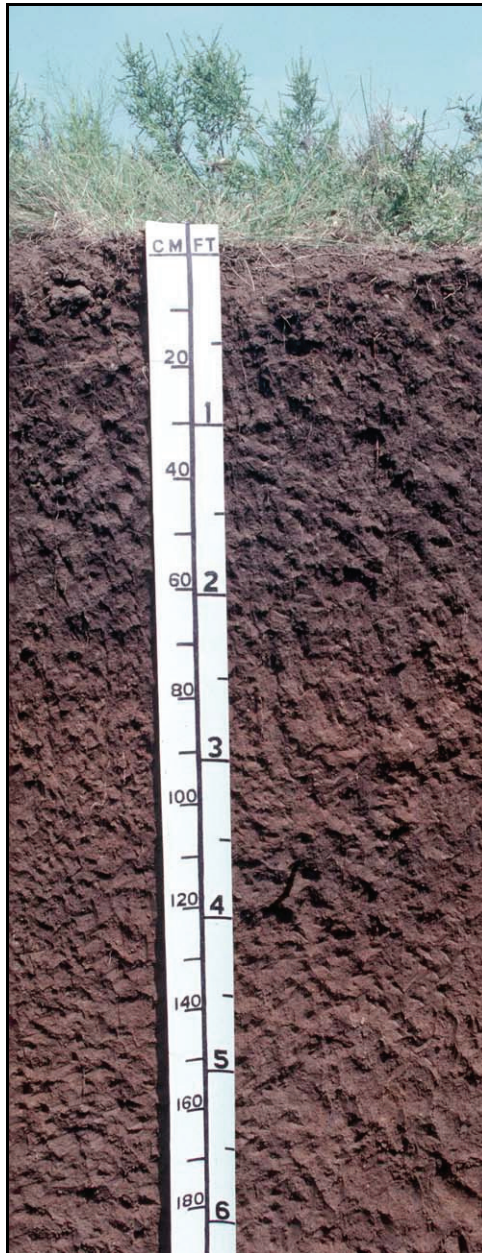


Figure 10.—Profile of Gowen loam, 0 to 1 percent slopes, occasionally flooded.
The different colors of soil are from flooding events in the past.

- AB—23 to 30 inches; brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate fine and medium angular blocky; hard, friable; common very fine and medium roots; few fine and medium tubular pores; common wormcasts; neutral; clear smooth boundary.
- Bw—30 to 41 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; common fine and medium faint dark yellowish brown (10YR 4/4) mottles; weak coarse prismatic structure parting to moderate fine and medium angular blocky; hard, friable; common fine and medium roots; common very fine to medium pores; dark brown (10YR 3/3) coatings on prism surfaces; few wormcasts; moderately alkaline; clear smooth boundary.
- Ab—41 to 51 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; common fine and medium dark yellowish brown (10YR 4/4) mottles; moderate coarse prismatic structure parting to moderate fine and medium angular blocky; hard, friable; common fine and medium roots; few fine and medium tubular pores; common fine faint dark brown (10YR 3/3) coatings on prism surfaces; few wormcasts; moderately alkaline; gradual smooth boundary.
- Bwb1—51 to 57 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; common fine and medium faint dark yellowish brown (10YR 4/4) mottles; weak coarse prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, very friable; common fine and medium roots; few fine pores; common fine faint very dark grayish brown (10YR 3/2) coatings on prism surfaces; few wormcasts; moderately alkaline; gradual smooth boundary.
- Bwb2—57 to 80 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; common faint yellowish brown (10YR 5/4) mottles; weak coarse prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, very friable; common fine faint brown (10YR 5/3) coatings on prism surfaces; few fine faint light brownish gray (10YR 6/2) coatings in root channels; common ferro-manganese concretions; few very fine calcium carbonate concretions; few wormcasts; slightly effervescent; moderately alkaline.

The solum thickness is more than 80 inches. The mollic epipedon is 20 to 51 inches thick. Depth to secondary carbonates is greater than 30 inches. Texture of the 10- to 40-inch control section is loam, sandy clay loam, or clay loam with a clay content of 20 to 35 percent.

The A or AB horizons have hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 1 to 3. Reaction ranges from neutral to moderately alkaline, and it is noncalcareous.

The Bw or Bk horizons have hue of 10YR, value of 3 to 6, and chroma of 2 to 6. Texture is loam, silty clay loam, sandy clay loam, or clay loam. Reaction ranges from neutral to moderately alkaline.

Grandfield Series

The Grandfield series is very deep, very gently sloping or gently sloping, well drained, soils on treads on stream terraces. These soils are moderately permeable. They formed in loamy alluvium on stream terraces of the Brazos River. Slope ranges from 0 to 5 percent. The soils of the Grandfield series are fine-loamy, mixed, superactive, thermic Typic Haplustalfs.

Typical pedon of Grandfield loamy fine sand, 0 to 3 percent slopes; from the intersection of Farm Road 926 and U.S. Highway 380 in Newcastle, 12.0 miles west on Farm Road 926, and 600 feet south in rangeland.

- A—0 to 8 inches; light brown (7.5YR 6/4) loamy fine sand, brown (7.5YR 4/4) moist; single grain; soft, very friable; common fine roots and pores; slightly alkaline; clear smooth boundary.

- Bt1—8 to 18 inches; red (2.5YR 5/6) sandy clay loam, dark red (2.5YR 3/6) moist; moderate fine and medium subangular blocky structure; hard, friable; few fine and medium roots; few fine pores; common distinct clay films on the surfaces of peds; 5 percent siliceous pebbles; slightly alkaline; gradual smooth boundary.
- Bt2—18 to 40 inches; red (2.5YR 4/6) sandy clay loam, dark red (2.5YR 3/6) moist; moderate medium subangular blocky structure; slightly hard, friable; few fine roots and pores; few wormcasts; common distinct clay films on surfaces of peds; slightly alkaline; gradual smooth boundary.
- Bt3—40 to 56 inches, red (2.5YR 5/6) sandy clay loam; dark red (2.5YR 3/6) moist; moderate fine and medium subangular blocky structure; hard, friable; few very fine roots; few fine pores; common distinct clay films on surfaces of peds; 3 to 5 percent films and threads of calcium carbonate and few concretions of calcium carbonate; moderately alkaline; clear smooth boundary.
- BCK—56 to 80 inches, red (2.5YR 5/6) fine sandy loam; red (2.5YR 4/6) moist; weak fine and medium subangular blocky structure; slightly hard, friable; common films, threads, and concretions of calcium carbonate; moderately alkaline.

The solum thickness is more than 60 inches. Depth to secondary carbonates is typically more than 30 inches.

The A horizon has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 3 or 4. Texture is loamy fine sand or fine sandy loam. Reaction ranges from moderately acid to slightly alkaline.

The Bt or BC horizons have hue of 2.5YR or 5YR, value of 4 to 6, and chroma of 4 or 6. Texture is fine sandy loam or sandy clay loam. Reaction ranges from slightly acid to moderately alkaline.

Grandmore Series

The Grandmore series is very deep, nearly level or very gently sloping, moderately well drained soils on depressions on treads on stream terraces of the Brazos River in slightly depressed concave positions. These soils are moderately slowly permeable. They formed in loamy alluvium. Slopes are 0 to 2 percent. The soils of the Grandmore series are fine-loamy, mixed, active thermic Typic Haplustalfs.

Typical pedon of Grandmore fine sandy loam, 0 to 2 percent slopes; from the intersection of Texas Highway 251 and U.S. Highway 380 south of Newcastle, 1.4 miles south on Texas Highway 251, and 0.6 mile southeast in cropland.

- Ap—0 to 5 inches; light brown (7.5YR 6/4) fine sandy loam; brown (7.5YR 4/4) moist; weak fine granular structure; soft, friable; common fine and medium roots; common fine and medium pores; neutral; gradual smooth boundary.
- A—5 to 18 inches; brown (7.5YR 5/3) fine sandy loam; brown (7.5YR 4/3) moist; weak fine and medium subangular blocky structure parting to moderate fine granular; soft, friable; few fine roots; few fine pores; slightly acid; clear smooth boundary.
- Bt1—18 to 38 inches; brown (7.5YR 4/4) loam; brown (7.5YR 4/3) moist; moderate fine and medium subangular blocky structure; hard, firm; few fine roots; few fine pores; few faint clay films on surfaces of ped; slightly alkaline; clear smooth boundary.
- 2Bt1b—38 to 48 inches; dark grayish brown (10YR 4/2) clay loam; very dark grayish brown (10YR 3/2) moist; moderate medium and coarse subangular blocky structure; very hard, very firm; few fine roots; few faint clay films on surfaces of peds; moderately alkaline; clear smooth boundary.
- 2Bt2b—48 to 59 inches; dark grayish brown (10YR 4/2) clay loam; very dark grayish brown (10YR 3/2) moist; moderate medium and coarse subangular blocky structure; very hard, very firm; few faint clay films on surfaces of peds; 3 percent

calcium carbonate concretions and soft masses; 1 percent ferro-manganese concretions; few medium faint brown (7.5YR 4/4) irregularly shaped ferro-manganese accumulations with clear boundaries in the matrix; moderately alkaline; clear smooth boundary.

2BC—59 to 80 inches; very pale brown (10YR 7/3) loamy fine sand; pale brown (10YR 6/3) moist; weak fine granular structure; soft; friable; common medium distinct red (2.5YR 5/8) and reddish yellow (5YR 6/8) irregularly shaped ferro-manganese accumulations with sharp boundaries in the matrix; common medium faint light brownish gray (10YR 6/2) irregularly shaped iron depletions with sharp boundaries in the matrix; moderately alkaline.

The solum thickness ranges from 60 to more than 80 inches. Clay content of the control section ranges from 18 to 35 percent.

The A horizon has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 3 or 4. Reaction ranges from moderately acid to moderately alkaline.

The Bt horizon has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 2 to 6. Texture is fine sandy loam, loam, or sandy clay loam. Reaction is slightly alkaline or moderately alkaline.

The 2Btb horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 1 to 4. Redoximorphic features have colors in shades of red, brown, or gray. Texture is clay loam or clay. Reaction is slightly alkaline or moderately alkaline.

The 2BC horizon has hue of 5YR to 10YR, value of 5 to 7, and chroma of 2 to 4. Redox features have colors in shades of red, brown or gray. Texture is loamy fine sand, fine sandy loam, clay loam, or clay. Reaction is slightly alkaline or moderately alkaline.

Harpersville Series

The Harpersville series is very shallow or shallow over claystone bedrock. This strongly rolling to hilly, well drained soil is on backslopes on ridges. These soils are very slowly permeable. They formed in residuum from claystone bedrock. Slope ranges from 8 to 45 percent. The soils of the Harpersville series are clayey, mixed, active, calcareous, thermic shallow Aridic Ustorthents.

Typical pedon of Harpersville clay in an area of Owens-Harpersville complex, 8 to 45 percent slopes, extremely bouldery; from the intersection of Farm Road 209 and Texas Highway 67 south of Graham, 6.8 miles west on Farm Road 209, and 170 feet north in rangeland.

A—0 to 8 inches; light yellowish brown (2.5Y 6/3) clay, light olive brown (2.5Y 5/3) moist; weak coarse and medium angular blocky structure; very hard, very firm; common fine and medium roots; very slightly effervescent; moderately alkaline; clear smooth boundary.

Cd1—8 to 18 inches; light olive gray (5Y 6/2) noncemented claystone bedrock, olive gray (5Y 4/2) moist; few fine distinct dark reddish brown (2.5YR 3/4) and weak red (2.5YR 5/2) mottles massive; extremely hard, very firm; noncalcareous; moderately alkaline; clear wavy boundary.

Cd2—18 to 60 inches; olive gray (5Y 5/2) noncemented claystone bedrock, olive gray (5Y 4/2) moist; few fine distinct yellow (10YR 7/8) and olive yellow (2.5Y 6/6) mottles; massive; extremely hard, very firm; noncalcareous; moderately alkaline.

The solum thickness ranges from 3 to 14 inches over densic material.

The A horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 2 to 4.

The Cd horizon has hue of 10YR to 5Y, value of 3 to 7, and chroma of 2 to 6. Mottles in shades of red and yellow are in some pedons. These materials are claystone bedrock with strata of loamy material in some profiles.

Heaton Series

The Heaton series is very deep, gently sloping, well drained soils on terraces on stream terraces of the Brazos River. These soils are moderately permeable. They formed in loamy Pleistocene alluvium. Slope ranges from 1 to 5 percent. The soils of the Heaton series are loamy, siliceous, semiactive, thermic Arenic Paleustalfs.

Typical pedon of Heaton fine sand, 1 to 5 percent slope; from the intersection of Texas Highway 67 and Farm Road 61 in Graham, 6.8 miles west on Farm Road 61, 2.2 miles north on Bullock Road, 0.8 mile southwest on pasture road, and 100 feet east in pastureland.

Ap—0 to 8 inches; brown (7.5YR 5/4) fine sand, brown (7.5YR 4/4) moist; single grain; loose; common fine roots and pores; neutral; clear smooth boundary.

E—8 to 32 inches; yellow (10YR 7/6) fine sand; brownish yellow (10YR 6/6) moist; single grain; loose, loose; common fine roots; common fine pores; neutral; clear smooth boundary.

Bt1—32 to 43 inches; yellowish red (5YR 5/6) sandy clay loam; yellowish red (5YR 4/6) moist; moderate medium subangular blocky structure; hard, firm; common fine roots; common fine pores; common distinct clay films on surfaces of peds; slightly acid; gradual smooth boundary.

Bt2—43 to 61 inches; reddish yellow (7.5YR 6/6) sandy clay loam; strong brown (7.5YR 5/6) moist; moderate medium subangular blocky structure; hard, firm; common fine roots; common fine pores; common faint clay films on surfaces of peds; few fine faint reddish yellow (5YR 6/6) and very pale brown (10YR 7/3) masses of oxidized iron; slightly acid; clear smooth boundary.

Bt3—61 to 80 inches; yellow (10YR 7/6) fine sandy loam; brownish yellow (10YR 6/6) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, very friable; few faint clay films between sand grains; 5 percent vertically oriented stripping of uncoated sand grains; few fine roots; neutral.

The solum thickness ranges from 60 to more than 80 inches. Texture of the control section is mainly sandy clay loam with clay content of 20 to 30 percent. Siliceous and ironstone pebbles range from none to a few throughout the pedon. Reaction ranges from moderately acid to neutral in the solum within 60 inches.

The Ap horizon has hue of 7.5YR or 10YR value of 4 to 6, and chroma of 3 or 4. The E horizon has colors with value and chroma 1 to 3 units greater than the A horizon.

The Bt1 and Bt2 horizons have hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 6 or 8. Texture is sandy clay loam or fine sandy loam.

The lower Bt3 horizon has hue of 5YR to 10YR, value of 4 to 7, and chroma of 6 or 8. Uncoated sand grains and skeletons are in some pedons below a depth of 60 inches.

Hensley Series

The Hensley series is shallow soils over limestone bedrock. These gently sloping, well drained soils are on shoulders on ridges. These soils are slowly permeable. They formed in residuum from limestone. Slope ranges from 1 to 3 percent. The soils of the Hensley series are clayey, mixed, active, thermic Lithic Rhodustalfs.

Typical pedon of Hensley stony loam, 1 to 3 percent slopes, extremely stony; from the intersection of Texas Highway 67 and Farm Road 701 south of South Bend, 3.6 miles south on Texas Highway 67, 2.0 miles east on Duff Prairie road, and 130 feet west in rangeland.

A—0 to 5 inches; reddish brown (5YR 4/4) stony loam, dark reddish brown (5YR 3/4) moist; moderate fine subangular blocky structure parting to moderate fine granular; hard, friable; common fine roots; 15 percent by volume of limestone from 10 to 24 inches across, 6 percent by volume of limestone from 24 to 40 inches across, 5

percent by volume of limestone from 3 to 10 inches across; 5 percent limestone gravel less than 3 inches across; slightly alkaline; clear smooth boundary.

Bt—5 to 14 inches; reddish brown (2.5YR 4/4) clay, dark reddish brown (2.5YR 3/4) moist; moderate fine angular blocky structure parting to moderate fine subangular blocky; very hard, very firm; common distinct clay films on surfaces of peds; slightly alkaline; abrupt wavy boundary.

R—14 to 20 inches; indurated limestone; coarsely fractured; less than 5 percent of volume is fine earth material in fractures and crevices.

The solum thickness ranges from 10 to 20 inches to indurated limestone.

The A horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4.

Texture is loam or its stony counterparts.

The Bt horizon has hue of 2.5YR, value of 3 or 4, and chroma of 4 or 6. Texture is clay loam or clay.

The R horizon is thick beds of fractured limestone bedrock.

Jacksboro Series

The Jacksboro series is shallow over conglomerate sandstone. These gently sloping, well drained soils are on summits on ridges. These soils are moderately slowly permeable. They formed in residuum of indurated conglomerate sandstone. Slope ranges from 1 to 3 percent. The soils of the Jacksboro series are clayey-skeletal, mixed, thermic Lithic Haplustalfs.

Typical pedon of Jacksboro fine sandy loam, 1 to 3 percent slopes; in Bryson, Jack County, 1.2 miles northwest, 1.2 miles north, and 0.2 mile northeast on county road, and 100 feet east of fence in rangeland. This site is 0.15 mile northeast of the Bryson Lake Dam.

A—0 to 4 inches; brown (10YR 4/3) fine sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure, hard, friable; many fine and medium roots; 5 percent by volume siliceous pebbles less than 1 inch in diameter; slightly acid; clear smooth boundary.

E—4 to 11 inches; light brown (7.5YR 6/4) very gravelly fine sandy loam, brown (7.5YR 5/4) moist; weak fine granular structure; hard, friable; many fine and medium roots; 35 percent by volume siliceous pebbles less than 2 inches in diameter; slightly acid; clear smooth boundary.

Bt—11 to 18 inches; red (10R 4/6) very gravelly clay, red (10R 4/6) moist; moderate medium subangular blocky structure; very hard, very firm; few fine roots; common thin clay films on faces of peds; 40 percent by volume siliceous pebbles less than 2 inches in diameter; few siliceous cobbles; slightly acid; abrupt smooth boundary.

R—18 to 25 inches; indurated conglomerate sandstone.

The solum thickness and depth to conglomerate sandstone is 15 to 20 inches. The clay content of the control section ranges from 35 to 45 percent.

The A horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4.

Coarse fragments consist mainly of siliceous pebbles and range from 2 to 14 percent by volume, most are less than 3 inches in diameter. Reaction is slightly acid or neutral.

The E horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 3 or 4.

Texture is gravelly fine sandy loam or very gravelly fine sandy loam. Coarse fragments range from 15 to 60 percent by volume and consist mainly of siliceous pebbles and cobbles ranging from less than 0.5 inch to 6 inches across. Reaction ranges from moderately acid to neutral.

The Bt horizon has hue of 10R or 2.5YR, value of 4 or 5, and chroma of 4 to 8.

Texture is very gravelly clay loam or very gravelly clay. Coarse fragments range from 35 to 60 percent by volume. Reaction ranges from strongly acid to slightly acid.

The R layer is indurated conglomerate sandstone consisting of siliceous pebbles, cobbles, and sand cemented with silica.

Jolly Series

The Jolly series is shallow over sandstone bedrock. These very gently sloping to strongly sloping, well drained soils are on shoulders on ridges. These soils are moderately permeable. They formed in residuum from fine and medium grained sandstone of Permian and Pennsylvanian age. Slope ranges from 1 to 12 percent. The soils of the Jolly series are loamy, siliceous, active, thermic, shallow Typic Haplustalfs. (Fig. 11)

Typical pedon of Jolly fine sandy loam in an area of Newcastle-Jolly complex, 1 to 5 percent slopes; from the intersection of Farm Road 210 and Texas Highway 79 in Olney, 9.8 miles west on Farm Road 210, 1.0 mile south on Farm Road 2898, 0.4 mile east, and 150 feet north in rangeland.

A1—0 to 3 inches; brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 3/4) moist; weak fine and medium subangular blocky structure parting to weak fine and medium granular; slightly hard, friable; many very fine and fine roots; common very fine and fine tubular pores; few wormcasts; slightly acid; clear smooth boundary.

A2—3 to 7 inches; brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 3/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable; many very fine and fine roots; common very fine and fine tubular pores; few faint clay films on surfaces of peds; few wormcasts; neutral; clear smooth boundary.

Bt1—7 to 15 inches; brown (7.5YR 5/4) sandy clay loam, brown (7.5YR 4/4) moist; moderate medium and coarse prismatic structure parting to moderate fine and medium angular blocky; hard, friable; many very fine, fine, and common medium and coarse roots; common fine and medium tubular pores; common distinct clay films on surfaces of peds; neutral; clear smooth boundary.

Bt2—15 to 19 inches; brown (7.5YR 5/4) very paragravelly sandy clay loam, brown (7.5YR 4/4) moist; moderate medium and coarse subangular blocky structure; hard, friable; few medium and coarse roots; many very fine, fine, and common medium pores; 49 percent subangular paragravel; common distinct clay films on surfaces of peds; few wormcasts; neutral; clear smooth boundary.

Cr/Bt—19 to 26 inches; 70 percent weakly cemented sandstone and 30 percent fine-earth material in fracture zones that are 0.5 inch to 12 inches in width and 10 to 48 inches apart; fine-earth material is reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; weak fine and medium subangular blocky structure; common very fine roots; common fine and medium tubular pores; few distinct clay films on surfaces of peds; many fine and medium dark gray (10YR 4/1) ferro-manganese concretions and stains; clear wavy boundary.

Cr—26 to 60 inches; weakly cemented sandstone; brownish yellow (10YR 6/6); massive; extremely hard, very firm; common distinct coatings of black (10YR 2/1) ferro-manganese stains.

The solum thickness and depth to cemented sandstone bedrock ranges from 12 to 20 inches. Coarse fragments on the surface range from none to 1 percent and from gravel to stone size with a few outcrops of sandstone bedrock.

The A horizon has hue of 5YR to 10YR, value of 3 or 5, and dominant chroma of 4. Texture is fine sandy loam or loam. Reaction is slightly acid or neutral.

The Bt horizon has hue of 5YR or 7.5YR, value of 4 or 5, and dominant chroma of 4. Clay content ranges from 15 to 30 percent, but average clay content of the control section ranges from 20 to 30 percent. Discontinuous layers of soft sandstone parafragments less than 3 inches across range from 0 to 15 percent. Reaction is slightly acid or neutral.

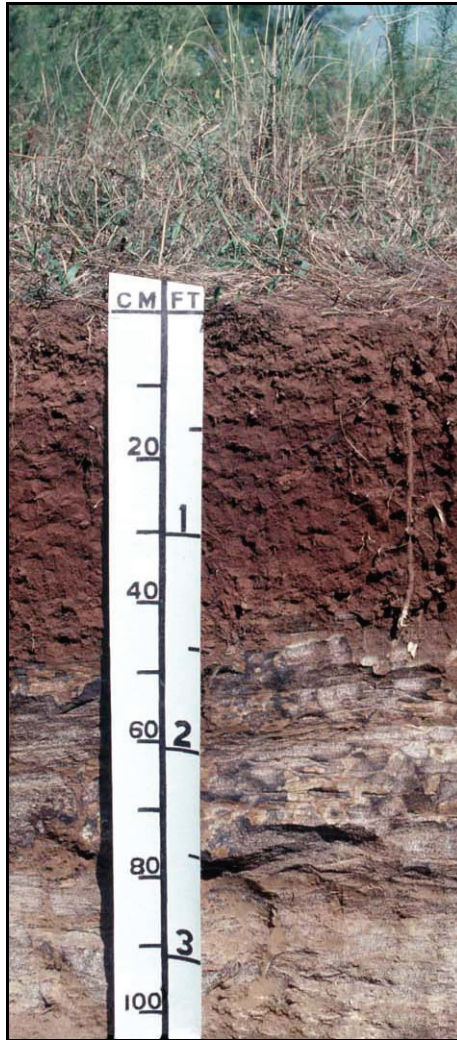


Figure 11.—Profile of Jolly fine sandy loam, in an area of Newcastle-Jolly complex, 1 to 5 percent slopes. A paralithic contact occurs at 18 inches (46 centimeters).

The Cr/Bt horizon has hue of 5YR or 7.5YR, value of 4 or 5, and dominant chroma of 4. Clay content ranges from 15 to 30 percent, but average clay content of the control section ranges from 20 to 30 percent. Discontinuous layers of soft sandstone parafragments less than 3 inches across range from 15 to 45 percent. Reaction is slightly acid or neutral.

The Cr layer is very weakly to moderately cemented, noncalcareous, horizontally layered sandstone in shades of brown, yellow, gray, or olive. Coarse red and brown mottles and black streaks occur in some pedons. The sandstone excavation difficulty is very high when slightly moist. In some pedons the Cr is interbedded or underlain by shale.

Kamay Series

The Kamay series is very deep, gently sloping, well drained soils on pediments. These soils are very slowly permeable. They formed in slope alluvium derived from Permian clayey shale. Slope ranges from 1 to 3 percent. The soils of the Kamay series are fine, smectitic, thermic Typic Paleustalfs. (Fig. 12)

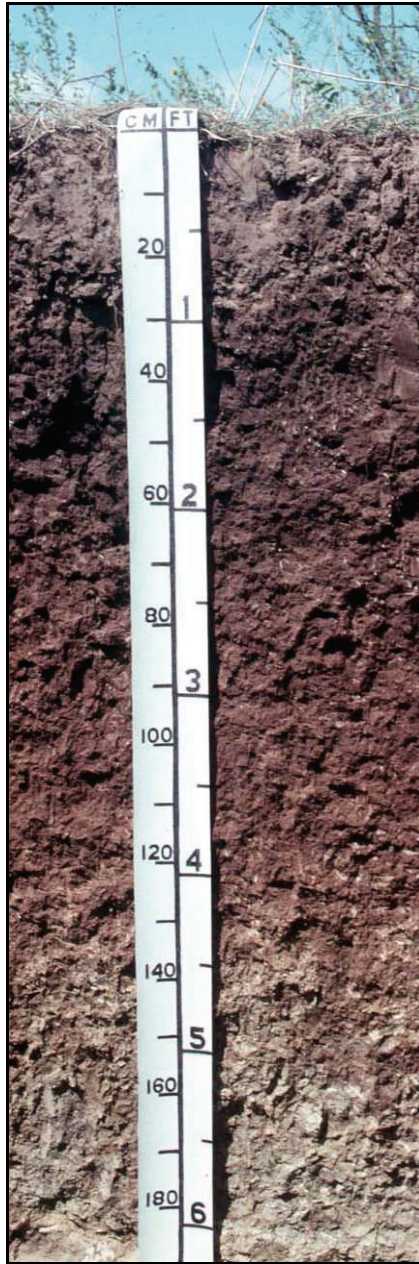


Figure 12.—Profile of Kamay silt loam, 1 to 3 percent slopes. The lighter-colored Cr material is composed of fractured and weathered limestone and shale.

Typical pedon of Kamay silt loam, 1 to 3 percent slopes; from the intersection of Texas Highway 61 and Farm Road 2652 in Graham, 11 miles north on Farm Road 2652, then 4.3 miles west on Texas Highway 114, 0.3 mile north, and 150 feet west in rangeland.

A1—0 to 5 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; hard, friable; common very fine, fine, and medium roots; slightly acid; gradual smooth boundary.

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- A2—5 to 12 inches; pale brown (10YR 6/3) loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; hard, friable; common very fine and fine roots; neutral; abrupt smooth boundary.
- Bt1—12 to 23 inches; dark reddish gray (5YR 4/2) clay, dark reddish brown (5YR 3/2) moist; weak coarse prismatic structure parting to weak fine and medium angular blocky; very hard, very firm; few very fine and fine roots; few very fine and fine pores; common distinct clay films on surfaces of peds; 1 percent ferro-manganese concretions; noneffervescence; neutral; gradual smooth boundary.
- Bt2—23 to 33 inches; reddish brown (5YR 4/3) clay, dark reddish brown (5YR 3/3) moist; weak coarse prismatic structure parting to weak fine and medium angular blocky; very hard, very firm; few very fine and fine roots; common distinct clay films on surfaces of peds; 1 percent ferro-manganese concretions; 1 percent fine calcium carbonate concretions; very slightly effervescent; neutral; gradual smooth boundary.
- Btk1—33 to 44 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; weak coarse prismatic structure parting to weak fine and medium angular blocky; very hard, very firm; few very fine and fine roots; few tubular pores; common distinct clay films on surfaces of peds; 2 percent ferro-manganese concretions; 5 percent masses and concretions of calcium carbonate; few siliceous pebbles (less than 0.25 inch); very slightly effervescent; slightly alkaline; gradual smooth boundary.
- Btk2—44 to 52 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; weak coarse prismatic structure parting to weak fine and medium angular blocky; very hard, very firm; few fine roots; common distinct clay films on surfaces of peds; 2 percent ferro-manganese concretions; 5 percent calcium carbonate concretions; very slightly effervescent; moderately alkaline; clear smooth boundary.
- BCtk1—52 to 63 inches; pale yellow (2.5Y 8/3) silty clay loam, light reddish brown (2.5YR 6/3) moist; weak coarse prismatic structure parting to medium angular blocky; very hard, friable; few very fine and fine roots; common faint reddish brown (5YR 4/4) clay films on surfaces of peds; 1 percent ferro-manganese concretions; common calcium carbonate concretions; very slightly effervescent; moderately alkaline; gradual smooth boundary.
- BCtk2—63 to 73 inches; light olive brown (2.5Y 5/3) and brown (7.5YR 5/3), silty clay loam, light olive gray (5Y 6/2); weak coarse prismatic structure parting to fine and medium angular blocky; hard, friable; few very fine and fine roots; few faint clay films on surfaces of peds; common fine calcium carbonate masses and concretions; slightly effervescent; moderately alkaline; abrupt smooth boundary.
- Cr—73 to 80 inches; light olive brown (2.5Y 5/4) fractured and weathered limestone and shale.

The solum thickness ranges from 60 to more than 80 inches. Depth to films, threads, masses, or concretions of calcium carbonate ranges from 12 to 28 inches. Clay content of the control section ranges from 35 to 50 percent. The boundary between the A and Bt horizon is abrupt or clear with an abrupt textural change.

The A horizon has hue of 5YR to 10YR, value of 3 to 6, and chroma of 2 to 4. Texture is loam or silt loam, and it is massive and hard or very hard when dry. Reaction ranges from slightly acid to slightly alkaline.

The Bt horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 2 to 4. Texture is clay loam or clay. Calcium carbonate ranges from 0 to 2 percent by volume. Reaction ranges from neutral to moderately alkaline.

The Btk horizon has hue of 2.5YR or 5YR, value of 4 to 6, and chroma of 3 to 6. Texture is clay loam or clay. The Btk horizon has 3 to 15 percent concretions or masses of calcium carbonate. Reaction is slightly alkaline or moderately alkaline.

The BCt or BCtk horizon, where present, has colors of red, brown, yellow, or gray. Texture is mainly silty clay loam, clay loam, or clay. Reaction is slightly alkaline or moderately alkaline.

Knoco Series

The Knoco Series is very shallow or shallow over Permian Redbed claystone. These gently sloping to steep, well drained to excessively drained soils are on backslopes on ridges. These soils are very slowly permeable. They formed in residuum from Permian Redbed claystone. Slope ranges from 3 to 45 percent. The soils of the Knoco series are clayey, mixed, active, (calcareous), thermic, shallow Ustic Torriorthents.

Typical pedon of Knoco clay in an area of Knoco-Vernon complex, 3 to 12 percent slopes; from the intersection of Farm Road 210 and Texas Highway 79 in Olney, 7.8 miles west on Farm Road 210, 0.7 mile south on county road, and 400 feet west in rangeland.

A—0 to 5 inches; reddish brown (2.5YR 4/4) clay, dark reddish brown (2.5YR 3/4) moist; moderate fine and medium subangular blocky structure; very hard, firm; sticky and plastic; few very fine and fine roots; few very fine and fine pores; few calcium carbonate concretions; few ferro-manganese concretions; 10 percent limestone pebbles on surface; very slightly effervescent; moderately alkaline; clear smooth boundary.

Cd1—5 to 13 inches; reddish brown (2.5YR 5/3) noncemented claystone bedrock, reddish brown (2.5YR 4/3) moist; many medium prominent light greenish gray (5GY 7/1) mottles; massive; very hard, firm; sticky and plastic; few very fine roots between old root channels; very slightly effervescent; moderately alkaline; gradual smooth boundary.

Cd2—13 to 20 inches; reddish brown (2.5YR 5/4) noncemented claystone bedrock, reddish brown (2.5YR 4/4) moist; common fine and medium prominent light greenish gray (5GY 7/1) mottles; massive parting to moderate fine and medium angular rock-like structure; noneffervescent; slightly alkaline; gradual smooth boundary.

Cd3—20 to 80 inches; reddish brown (2.5YR 5/3) noncemented claystone bedrock; reddish brown (2.5YR 4/3) moist; many medium prominent light greenish gray (5GY 7/1) mottles; massive parting to moderate coarse and medium angular rock-like structure; noneffervescent; slightly alkaline.

The solum thickness ranges from 4 to 20 inches. Typically, the soil is effervescent throughout. Ironstone gravel, nodules, and sandstone pebbles range from 0 to 15 percent on the surface. Limestone or sandstone boulders range from 0 to 10 percent on the surface.

The A horizon has hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 4 or 6. The A horizon ranges from 3 to 14 inches thick.

The Cd1 horizon has hue of 2.5YR or 5YR, value of 4 to 6, and chroma of 3 to 6. Some pedons have common mottles or strata in shades of gray. Texture is dense clay or claystone bedrock. Some pedons have a few gypsum crystals.

The lower Cd horizons have colors mainly of red with few to common mottles or strata in shades of gray.

Leeray Series

The Leeray series is very deep, nearly level or very gently sloping, well drained soils on terrace remnants. These soils are very slowly permeable. They formed in calcareous clayey sediments. Slope ranges from 1 to 3 percent. The soils of the Leeray series are fine, smectitic, thermic Typic Haplusterts.

Typical pedon of Leeray clay, 1 to 3 percent slopes; from the intersection of U.S. Highway 380 and Texas Highway 16 in Graham, 5 miles west on U.S. Highway 380, 5.6 miles north on Farm Road 1769, and 40 feet east in rangeland.

A1—0 to 9 inches; very dark grayish brown (10YR 3/2) clay, very dark grayish brown (10YR 2/2) moist; moderate fine and medium angular blocky structure; very hard,

very firm; common fine and medium roots; few fine pores; common pressure faces; 2 percent calcium carbonate concretions; 1 percent ferro manganese concretions; moderately alkaline; gradual wavy boundary.

A2—9 to 20 inches; very dark grayish brown (10YR 3/2) clay, very dark brown (10YR 2/2) moist; few fine faint dark grayish brown 10YR(4/2) mottles in cracks; moderate coarse and medium angular blocky structure; very hard, very firm; few fine and medium roots; few fine pores; common pressure faces; few fine distinct slickensides in lower part; 2 percent calcium carbonate concretions; very slightly effervescent; moderately alkaline; gradual wavy boundary.

Bkss1—20 to 42 inches; brown (10YR 4/3) clay, dark brown (10YR 3/3) moist; few fine faint dark grayish brown mottles (10YR 4/2) in root channels; moderate coarse and medium angular blocky structure; extremely hard, extremely firm; few fine roots; few fine pores; common medium distinct slickensides; common pressure faces; 5 percent calcium carbonate concretions and, soft masses; few ferro-manganese concretions; slightly effervescent; moderately alkaline; gradual wavy boundary.

Bkss2—42 to 54 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; few fine faint dark grayish brown (10YR 4/2) mottles in root channels; moderate medium angular blocky structure; very hard, very firm; few very fine roots; few fine pores; common slickensides: common pressure faces; 5 percent calcium carbonate concretions; few ferro-manganese concretions; strongly effervescent; moderately alkaline; gradual wavy boundary.

2BCK1—54 to 64 inches; brown (7.5YR 5/4) clay, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; extremely hard, extremely firm; few fine faint reddish yellow (7.5YR 6/6), masses of oxidized iron; few fine faint dark grayish brown (10YR 4/2) iron depletions in root channels; 7 percent calcium carbonate concretions and soft masses; 5 percent gypsum crystals; few ferro-manganese concretions; strongly effervescent, moderately alkaline; gradual wavy boundary.

2BCK2—64 to 80 inches; reddish yellow (7.5YR 6/6) clay, strong brown (7.5Y 5/6) moist; weak medium subangular blocky structure; extremely hard, extremely hard, extremely firm; many coarse prominent pale olive (5Y 6/3), common fine faint pale yellow (5Y 7/3), common fine distinct reddish brown (5YR 5/4) masses of oxidized iron; 8 percent calcium carbonate concretions and soft masses; 7 percent gypsum crystals; few ferro-manganese concretions; strongly effervescent, moderately alkaline.

The solum thickness ranges from 40 to more than 80 inches. Depth to films, threads, masses, or concretions of calcium carbonate ranges from 9 to 18 inches.

The A horizon has hue of 7.5YR or 10YR, value of 2 to 5, and chroma of 2. Reaction is slightly alkaline or moderately alkaline.

The Bkss horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 2 to 4. Texture is silty clay or clay. Reaction is moderately alkaline.

The 2BCK horizon has hue of 7.5YR to 5Y, value of 5 to 7, and chroma of 4 or 6. Texture is silty clay or clay. Reaction is moderately alkaline.

Lincoln Series

The Lincoln series is very deep, nearly level, somewhat excessively drained soils on natural levees. These soils are rapidly permeable. They formed in sandy alluvium of recent age. Slope ranges from 0 to 1 percent. The soils of the Lincoln series are sandy, mixed, thermic Typic Ustifluvents.

Typical pedon of Lincoln sandy loam, 0 to 1 percent slopes, occasionally flooded; from the intersection of Farm Road 926 and U.S. Highway 380 in Newcastle, 12.5 miles

west on Farm Road 926, 1.1 miles west on Texas Highway 79, 0.5 mile north, and 225 feet east in rangeland.

A—0 to 6 inches: reddish yellow (5YR 6/6) sandy loam, yellowish red (5YR 4/6) moist; weak granular structure and single grain; loose; common fine roots; slightly effervescent; moderately alkaline; clear smooth boundary.

C—6 to 80 inches; pink (7.5YR 8/4) fine sand, pink (7.5YR 7/4) moist; single grain; loose; common fine roots in upper part; few distinct bedding planes are evident; slightly effervescent; moderately alkaline.

These soils are moderately alkaline and effervescent throughout the 10- to 40-inch control section. In some pedons, the upper 10 inches is noncalcareous and slightly alkaline.

The A horizon has hue of 5YR, value of 4 to 6, and chroma of 4 or 6. Textures are dominantly sandy loam, but ranges from sand to clay loam.

The C horizon has hue of 5YR or 7.5YR, value of 6 or 8, and chroma of 4 or 6. Texture is loamy fine sand stratified with lenses of fine sandy loam, silt loam, or loam.

Lindy Series

The Lindy series is moderately deep over limestone bedrock. These very gently sloping, well drained soils are on summits on ridges. These soils are slow permeable. They formed in residuum from limestone. Slope ranges from 1 to 3 percent. The soils of the Lindy series are fine, mixed, active, thermic Udic Haplustalfs.

Typical pedon of Lindy silt loam, 1 to 3 percent slopes; from the intersection of Texas Highway 16 and Farm Road 1287 south of Graham, 9.4 miles south on Texas Highway 16, 1.4 miles west on county road, and 100 feet south in rangeland.

A—0 to 7 inches; brown (7.5YR 5/4) silt loam, brown (7.5YR 4/4) moist; weak medium granular structure; hard, friable; common fine and medium roots; few fine and medium pores; few wormcasts; 1 percent ferro-manganese concretions; neutral; clear wavy boundary.

Bt1—7 to 13 inches; reddish brown (5YR 4/4) clay loam, dark reddish brown (5YR 3/4) moist; moderate medium subangular blocky structure; hard, firm; common fine roots; few faint clay films on surfaces of peds; neutral; clear wavy boundary.

Bt2—13 to 24 inches; red (2.5YR 4/6) clay, dark red (2.5YR 3/6) moist; moderate coarse and medium subangular blocky structure; very hard very firm; few fine roots; few fine and medium pores; common distinct clay films on surfaces of peds; slightly alkaline; clear wavy boundary.

Bt3—24 to 32 inches; red (2.5YR 5/6) clay, red (2.5YR 4/6) moist; moderate coarse and medium subangular blocky structure; very hard, very firm; few fine roots; few fine and medium pores; common distinct clay films on surfaces of peds; slightly alkaline; abrupt wavy boundary.

R—32 to 40 inches; indurated limestone bedrock.

The solum thickness ranges from 20 to 40 inches. The lower boundary of the solum rests abruptly on limestone bedrock, or grades into bedded limestone with soil occupying the interstices.

The A horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is silt loam. Reaction is neutral or slightly alkaline.

The Bt horizon has hue of 2.5YR to 7.5YR, value of 3 to 5, and chroma of 4 or 6. Texture is clay loam or clay. Clay content ranges from 35 to 60 percent. Reaction is neutral or slightly alkaline.

Loving Series

The Loving series is very shallow or shallow soils over sandstone bedrock. These undulating, well drained, soils are on shoulders on ridges. These soils are on moderately rapidly permeable. They formed in loamy residuum from sandstone bedrock. Slope ranges from 1 to 8 percent. The soils of the Loving series are loamy, siliceous, active, nonacid, thermic, shallow, Typic Ustorthents.

Typical pedon of Loving fine sandy loam, from an area of Exray-Loving complex, 1 to 8 percent slopes, extremely stony; from the intersection of Texas Highway 114 and Texas Highway 16 in Loving, 5.7 miles north on Texas Highway 16, 3.0 miles east-southeast on Stewart Ranch Road, and 60 feet south of in rangeland.

A1—0 to 6 inches; dark yellowish brown (10YR 4/4) fine sandy loam, dark yellowish brown (10YR 3/4) moist; weak granular structure; soft, very friable; common fine and medium roots; common fine pores; 5 percent sandstone gravel; 5 percent of the surface is covered with stones, and 1 percent boulders 2 to 5 feet across and 2 to 10 feet long; slightly acid; clear smooth boundary.

A2—6 to 16 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak granular; slightly hard, friable; common fine roots; few fine pores; 5 percent sandstone gravel in the lower part; slightly acid; abrupt wavy boundary.

Cr—16 to 20 inches, reddish yellow (7.5YR 7/6), and yellowish red (5YR 5/6) weakly cemented sandstone bedrock; slightly acid.

The solum thickness ranges from 10 to 20 inches.

The A horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is fine sandy loam or cobbly fine sandy loam. Gravel and cobbles range from 0 to 25 percent by volume. Reaction is slightly acid or neutral.

The A2 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is fine sandy loam. Gravel content ranges from 0 to 10 percent. Reaction is slightly acid or neutral.

The Cr horizon is very weakly to moderately cemented sandstone bedrock. The Cr horizon has hue of 2.5YR to 10YR, value of 4 to 7, and chroma of 3 to 8.

Minwells Series

The Minwells series is very deep, very gently sloping, well drained soils on treads on high stream terraces of the Brazos River. These soils are slowly permeable. They formed in loamy and clayey sediments underlain by gravelly Quaternary alluvium. Slope ranges from 1 to 3 percent. The soils of the Minwells series are fine, mixed, active, thermic Udic Paleustalfs.

Typical pedon of Minwells fine sandy loam, 1 to 3 percent slopes; from the intersection of Texas Highway 67 and Farm Road 701 in south Bend, 3.6 miles south on Texas Highway 67, 2.7 miles west on county road, and 0.1 mile east of county road to south edge of gravel pit.

A—0 to 9 inches; brown (7.5YR 5/4) fine sandy loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure parting to weak fine granular; hard, friable; few fine roots; few fine and medium rounded siliceous pebbles; neutral; clear smooth boundary.

Bt1—9 to 24 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; moderate coarse and medium subangular blocky structure; very hard, firm; common fine roots; few fine pores; common distinct clay films on surfaces of peds; few rounded siliceous pebbles; slightly alkaline; gradual smooth boundary.

Bt2—24 to 50 inches; red (2.5YR 5/6) clay, red (2.5YR 4/6) moist; moderate coarse and medium subangular blocky structure; very hard, firm; few fine roots; few fine pores; common distinct clay films on surfaces of peds; 5 percent rounded siliceous pebbles; slightly alkaline; gradual smooth boundary.

Bt3—50 to 68 inches; red (2.5YR 5/6) sandy clay, red (2.5YR 4/6) moist; weak coarse and medium subangular blocky structure; very hard, firm; few fine roots; few fine pores; few distinct clay films on surfaces of peds; 10 percent well graded siliceous pebbles; moderately alkaline; gradual wavy boundary.

2C—68 to 80 inches; red (2.5YR 5/6) very gravelly sand, red (2.5YR 4/6) moist; massive; hard, friable; 60 percent well graded siliceous pebbles; few coatings of calcium carbonate on some pebbles; noneffervescent matrix; moderately alkaline.

The solum thickness ranges from 60 to 80 inches. Depth to beds of gravel or gravel and sand range from 48 to 80 inches.

The A horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. Reaction is slightly acid to slightly alkaline.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 or 6. Texture is sandy clay loam, sandy clay, or clay. Reaction is moderately acid to slightly alkaline.

The 2C horizon has hue of 2.5YR or 5YR, value of 4 to 7, and chroma of 6 or 8. Texture is gravelly or very gravelly, sand. Reaction is neutral to moderately alkaline.

Newcastle Series

The Newcastle series is moderately deep over sandstone bedrock. These very gently to gently sloping, well drained soils are on summits on ridges. These soils are moderately permeable. These soils formed in residuum from sandstone bedrock. Slope ranges from 1 to 5 percent. The soils of the Newcastle series are fine-loamy, siliceous, active, thermic Typic Haplustalfs. (Fig 13)

Typical pedon of Newcastle, fine sandy loam, 1 to 3 percent slopes; from the intersection of Farm Road 926 and Farm Road 251 in Newcastle; 1.8 miles west on Farm Road 926, 0.1 mile east, 2.6 miles north on Kinser Road, and about 85 feet east in rangeland.

Ap—0 to 7 inches; brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 3/4) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, friable; common fine and medium roots; common fine and medium tubular and vesicular pores; slightly acid; clear smooth boundary.

Bt1—7 to 19 inches; yellowish red (5YR 4/6) sandy clay loam, reddish brown (5YR 4/4) moist; weak coarse prismatic structure parting to weak fine and medium subangular blocky; hard, firm; few fine roots; few fine tubular pores; common distinct clay films on ped faces; few ferro-manganese concretions; slightly alkaline; clear wavy boundary.

Bt2—19 to 28 inches; reddish yellow (7.5YR 6/6) sandy clay loam, strong brown (7.5YR 5/6) moist; moderate coarse prismatic structure parting to moderate fine and medium subangular blocky; hard, firm; few very fine roots; few fine and medium tubular pores; common faint clay films on ped faces; few irregular ferro-manganese concretions less than 0.25 inch across; few red (2.5YR 4/6) ferro-manganese coatings on surfaces of some peds; few sandstone fragments less than 1 inch across; noneffervescent; moderately alkaline; abrupt wavy boundary.

Cd1—28 to 34 inches; yellow (10YR 7/6), noncemented sandstone bedrock that slakes in water, brownish yellow (10YR 6/6) moist; about 3 percent by volume distinct discontinuous very dark gray (10YR 3/1) moderately cemented ironstone and sandstone strata 0.5 to 1 inch thick; few very fine roots in cracks that are 4 inches to 2 feet apart horizontally; noneffervescent; moderately alkaline; abrupt wavy boundary.

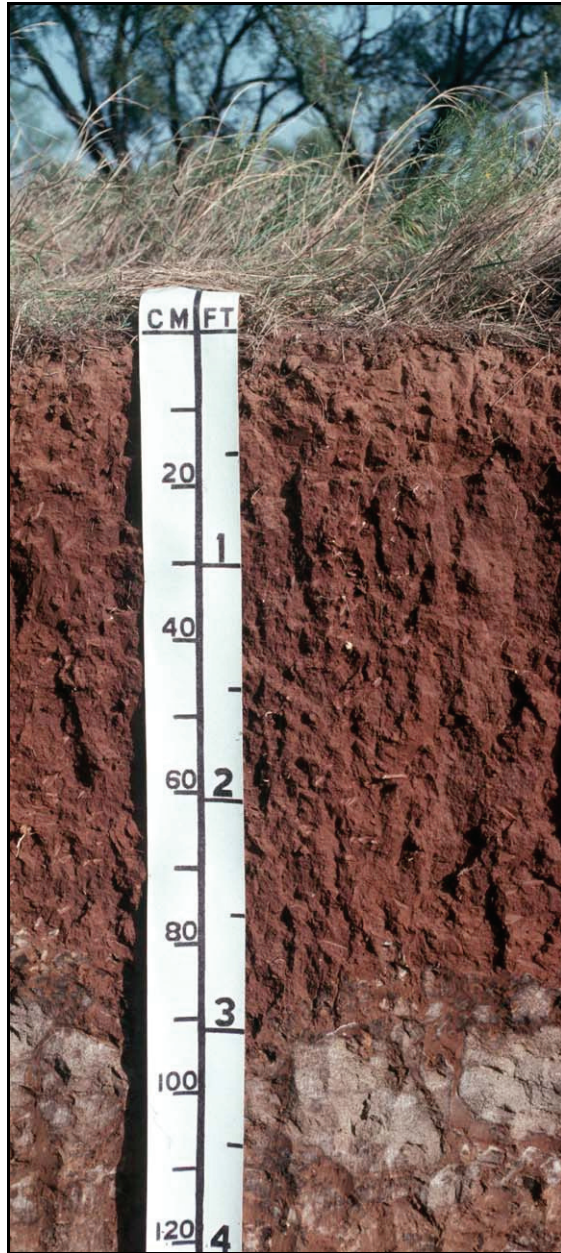


Figure 13.—Profile of Newcastle fine sandy loam, 1 to 3 percent slopes. Depth to a paralithic contact is 28 to 38 inches (71 to 97 centimeters).

Cd2—34 to 60 inches; 65 percent brown (7.5YR 4/4) and 35 percent yellowish red (5YR 5/6) noncemented sandstone bedrock that slakes in water; about 1 percent by volume distinct discontinuous very dark gray (10YR 3/1) moderately cemented ironstone; fractures are 2 to 5 feet apart horizontally; noneffervescent; moderately alkaline.

The solum thickness and depth to sandstone bedrock ranges from 20 to 40 inches. Base saturation is more than 75 percent in at least one Bt horizon. Siliceous pebbles, cobbles, and parafragments of sandstone range from 0 to 10 percent.

The A horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 3 to 6. Texture is loamy fine sand, fine sandy loam, or loam. Reaction is slightly acid or neutral.

The E horizon, where present, has hue of 5YR to 10YR, value of 5 to 7, and chroma of 3 to 6. Texture is loamy fine sand or fine sandy loam. Reaction is slightly acid or neutral.

The Bt horizon has hue of 2.5YR to 10YR, value of 3 to 6, and chroma of 3 to 8. Texture is fine sandy loam or sandy clay loam. Reaction ranges from slightly acid to moderately alkaline and is noncalcareous.

The Cd or Cr horizon is noncemented to moderately cemented sandstone bedrock that can be chipped with a spade when moist, when dry excavation is very hard. The sandstone is in shades of red, reddish brown, yellowish brown, or grayish brown.

Nukrum Series

The Nukrum series is very deep, nearly level, well drained soils on remnant paleoterraces. These soils are slowly permeable. They formed in calcareous loamy and clayey alluvium. Slope ranges from 0 to 1 percent. The soils of the Nukrum series are fine, smectitic, thermic Vertic Haplustolls.

Typical pedon of Nukrum clay loam, 0 to 1 percent slopes; from the intersection of Loop 132 and Texas Highway 79 in Olney, 0.2 mile north on Loop 132, 2.1 miles west on Airport Road, and 100 feet south in cropland.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; hard, friable; few fine roots; common fine pores; 1 percent concretions of calcium carbonate; slightly effervescent; moderately alkaline; clear smooth boundary.

A—6 to 13 inches; dark grayish brown (10YR 4/2) clay, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; hard, firm; few fine roots; common fine pores; 1 percent concretions of calcium carbonate; slightly effervescent; moderately alkaline; gradual wavy boundary.

Bw1—13 to 29 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; weak medium angular blocky structure parting to moderate fine and medium subangular blocky; very hard, very firm; common fine pores; few pressure faces; 3 percent concretions and masses of calcium carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bw2—29 to 43 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; moderate medium angular blocky structure parting to moderate medium subangular blocky; very hard, very firm; common pressure faces; 5 percent concretions and masses of calcium carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bk1—43 to 51 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; common medium prominent very pale brown (10YR 7/4), common medium distinct dark grayish brown (10YR 4/2) mottles; moderate medium angular blocky structure parting to moderate medium subangular blocky; very hard, very firm; 12 percent concretions and masses of calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk2—51 to 80 inches; yellow (10YR 7/6) silty clay loam, brownish yellow (10YR 6/6) moist; few fine distinct dark grayish brown (10YR 4/2) and yellow (10YR 7/8) mottles; weak fine and medium subangular blocky structure; hard, firm; 40 percent concretions and masses of calcium carbonate; violently effervescent; moderately alkaline.

The solum thickness ranges from 40 to more than 60 inches. Distinct calcium carbonate accumulations begin at depths of 24 to 40 inches. The COLE exceeds 0.07; when dry, cracks up to 1 inch wide extend from the surface to a depth of 20 to 30 inches.

The A and Bw horizons have hue of 10YR, value of 3 to 5, and chroma of 2 or 3. Texture is clay loam or clay. The clay content of the B horizon ranges from 35 to 50 percent which is slightly higher than that of the A horizon. Some pedons do not have Bw horizons.

The Bk or B_{ck} horizons have hue of 5YR to 10YR, value of 4 to 7, and chroma of 3 to 6. Texture is silty clay loam, clay loam, or clay. Calcium carbonate equivalent is 20 to 60 percent. Carbonates are in the form of powdery masses and concretions.

Owens Series

The Owens series is shallow to moderately deep over claystone bedrock. These gently sloping to steep, well drained soils are on backslopes on ridges. These soils are very slowly permeable. They formed on residuum from Pennsylvanian claystone bedrock. Slope ranges from 5 to 45 percent. The soils of the Owens series are fine, mixed, active, thermic Typic Haplustepts.

Typical pedon of Owens clay in an area of Owens-Harpersville complex, 8 to 45 percent slopes, extremely bouldery; from the intersection of Farm Road 209 and Texas Highway 67 south of Graham, 6.8 miles west on Farm Road 209, and 100 feet north in rangeland.

A—0 to 6 inches; pale olive (5Y 6/3) clay; olive (5Y 4/3) moist; weak fine and medium angular blocky structure; very hard, very firm; common fine roots; few films, threads and concretions of calcium carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bk—6 to 19 inches; pale olive (5Y 6/3) clay; olive (5Y 5/3) moist; moderate medium angular blocky structure; extremely hard, very firm; few fine roots; few fine pores; common films, threads and concretions of calcium carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cd1—19 to 35 inches; brown (10YR 5/3) noncemented claystone bedrock; brown (10YR 4/3) moist; common distinct olive brown (2.5Y 4/4), pale yellow (2.5Y 8/2), dark brown (7.5YR 4/4), and pink (5YR 7/4) mottles; massive; extremely hard, extremely firm; noncalcareous; moderately alkaline; clear smooth boundary.

Cd2—35 to 60 inches; gray (5Y 6/1) noncemented claystone bedrock; dark gray (5Y 4/1) moist; common distinct light gray (5Y 7/2), olive gray (5Y 4/2), and pale yellow (5Y 7/3) mottles; massive; extremely hard, extremely firm; noncalcareous; moderately alkaline.

The solum thickness ranges from 14 to 30 inches.

The A horizon has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 2 to 6. Texture is clay or their stony or bouldery counterparts. Reaction is moderately alkaline.

The Bk horizon has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 2 to 6. Texture is clay loam, silty clay, or clay. Reaction is moderately alkaline.

The Cd horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 to 6. Texture is dense clay or noncemented claystone bedrock.

Padgett Series

Padgett series is very deep, nearly level, well drained soils on flood plains. These soils are very slowly permeable. They formed in calcareous clayey alluvium. Slope ranges from 0 to 1 percent. The soils of the Padgett series are fine, mixed, active, thermic Chromic Haplusterts.

Typical pedon on Padgett clay, 0 to 1 percent slopes, occasionally flooded; from the intersection of Farm Road 926 and U.S. Highway 251, in Newcastle, 6.3 miles west on Farm Road 926, 1.0 mile southwest on pasture road, and 60 feet east of field in rangeland.

A—0 to 9 inches; brown (7.5YR 5/4) clay, brown (7.5YR 4/4) moist; moderate fine and medium subangular blocky structure; very hard, firm; few fine roots; few fine

pores; few dry weather cracks from 0.25 to 0.5 inch wide; slightly effervescent; moderately alkaline; clear wavy boundary.

Bw—9 to 22 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; moderate fine and medium subangular blocky structure; extremely hard, very firm; few fine roots; few fine pores; common pressure faces; slightly effervescent; moderately alkaline; clear wavy boundary.

Bkss1—22 to 28 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; moderate medium subangular blocky structure; extremely hard, extremely firm; few fine roots; few fine pores; few pressure faces; few slickensides; few films and threads of calcium carbonate; slightly effervescent; moderately alkaline; clear wavy boundary.

Bkss2—28 to 40 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; moderate coarse and medium subangular blocky structure; extremely hard, extremely firm; few fine roots; common pressure faces; common slickensides; few films and threads of calcium carbonate; slightly effervescent; moderately alkaline; gradual wavy boundary.

Bkss3—40 to 66 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; weak coarse and medium subangular blocky structure; extremely hard; extremely firm; few fine roots; common pressure faces; common slickensides; common films and threads of calcium carbonate; few ferro-manganese concretions; slightly effervescent; moderately alkaline; gradual wavy boundary.

Bkss4—66 to 80 inches; yellowish red (5YR 5/6) clay, yellowish red (5YR 4/6) moist; weak coarse and medium subangular blocky structure; extremely hard; extremely firm; few fine roots; few pressure faces; few slickensides; few films and threads of calcium carbonate; few ferro-manganese concretions; few fine faint red (2.5YR 4/6) redox accumulations; slightly effervescent; moderately alkaline.

The solum thickness is more than 60 inches. These soils are typically calcareous throughout. Clay content in the control section ranges from 40 to 60 inches. Some pedons have buried A horizons and organic staining in vertical cracks. Gilgai microrelief is also present in some areas.

The A horizon has hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 3 or 4. Dry-weather cracks from 0.25 to 0.5 inch wide occur in most pedons. Reaction is slightly alkaline or moderately alkaline.

The Bw, Bss, and Bkss horizons have hue of 2.5YR to 5YR, value of 3 to 5, and chroma of 4 or 6. Texture is silty clay, or clay. Reaction is slightly alkaline or moderately alkaline.

Palopinto Series

The Palopinto series consists of very shallow and shallow soils over limestone. These very gently sloping to moderately steep, well drained soils are on shoulders on ridges. These soils are moderately permeable. They formed in residuum of Pennsylvanian limestone. Slope ranges from 1 to 20 percent. The soils of the Palopinto series are loamy-skeletal, mixed, superactive, thermic Lithic Haplustolls.

Typical pedon of Palopinto stony loam in an area of Set-Palopinto complex, 8 to 40 percent slopes, extremely stony; from the intersection of Farm Road 1287 and Texas Highway 16 in Graham, 4.6 miles south on Farm Road 1287, 6.2 miles east-southeast on Ming Bend Road, 0.6 mile south of Ming Bend Cemetery on ranch road, and 120 west in rangeland.

A1—0 to 4 inches; dark grayish brown (10YR 4/2) very stony loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium granular structure; hard, friable; common fine roots; common fine and medium pores; 15 percent by volume of limestone from 10 to 24 inches across, 6 percent by volume of

limestone from 24 to 40 inches across, 5 percent by volume of limestone from 3 to 10 inches across; moderately alkaline; clear smooth boundary.

A2—4 to 13 inches; dark grayish brown (10YR 4/2) extremely stony loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure parting to moderate fine granular; common fine roots; common fine pores; 45 percent by volume of limestone from 3 to 10 inches across, 30 percent by volume of limestone from 10 to 24 inches across, 5 percent by volume of limestone from 24 to 40 inches across; moderately alkaline; abrupt smooth boundary.

R—13 to 20 inches; indurated limestone bedrock; coarsely fractured less than 5 percent of volume is fine earth in fractures and crevices.

The solum thickness ranges from 6 to 20 inches to indurated limestone. The solum contains 30 to 80 percent coarse fragments of flat limestone that range from 0.5 to 24 inches across. The soil is typically noncalcareous but some pedons are slightly effervescent.

The A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 or 3.

Texture is loam, clay loam, or their very stony or extremely stony counterparts. Reaction is slightly alkaline or moderately alkaline.

The R horizon is thick beds of fractured indurated limestone bedrock.

Rowden Series

The Rowden series is moderately deep over indurated limestone bedrock. These nearly level or very gently sloping, well drained soils are on summits on ridges. These soils are slowly permeable. They formed in loamy and clayey residuum of indurated limestone bedrock. Slope ranges from 0 to 2 percent. The soils of the Rowden series are fine, mixed, superactive, thermic Typic Argiustolls.

Typical pedon of Rowden clay loam, 0 to 2 percent slopes; from the intersection of Farm Road 1287 and Ming Bend Road south of Bunger, 3.5 miles south on Farm Road 1287, and 0.45 mile west in rangeland.

A—0 to 13 inches; brown (7.5YR 4/2) clay loam, dark brown (7.5YR 3/2) moist; moderate fine subangular blocky structure; hard, friable; common fine roots; few fine pores; few wormcasts; slightly alkaline; clear smooth boundary.

Bt1—13 to 24 inches; dark reddish brown (5YR 3/4) clay, dark reddish brown (5YR 3/4) moist; moderate fine and medium angular blocky structure; very hard, firm; common fine roots; few fine pores; common distinct clay films on surfaces of peds; few wormcasts; slightly alkaline; clear wavy boundary.

Bt2—24 to 35 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; moderate medium angular blocky structure; very hard, firm; few fine roots; few fine pores; common distinct clay films on surfaces of peds; few wormcasts; moderately alkaline; abrupt wavy boundary.

R—35 to 60 inches; indurated limestone bedrock.

The solum thickness ranges from 20 to 40 inches. The lower boundary of the solum rests abruptly on limestone bedrock or grades into bedded limestone with soil occupying the interstices.

The A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 or 3.

Reaction ranges from neutral to moderately alkaline.

The Bt horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 3 or 4.

Texture is clay loam or clay. Reaction is slightly alkaline or moderately alkaline.

The R layer is indurated limestone bedrock that is in shades of pink to reddish brown.

Sagerton Series

The Sagerton series is very deep, nearly level or very gently sloping, well drained soils on remnant paleoterraces. These soils are moderately slowly permeable. They formed in calcareous loamy and clayey alluvium. Slope ranges from 0 to 3 percent. The soils of the Sagerton series are fine, mixed, superactive, thermic Typic Argiustolls.

Typical pedon of Sagerton loam, 0 to 1 percent slopes; from the intersection of Farm Road 210 and Texas 79 in Olney, 4.35 miles west on Farm Road 210, 0.3 mile south, and 25 feet east in field.

- Ap—0 to 5 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; hard, friable; sticky and plastic; common fine and medium roots; common pores; few wormcasts; 2 percent siliceous pebbles; slightly effervescent; slightly alkaline; abrupt smooth boundary.
- A—5 to 13 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; hard, friable, sticky and plastic; common fine and medium roots; common pores; few wormcasts; 2 percent siliceous pebbles; slightly effervescent; slightly alkaline; abrupt smooth boundary.
- Bt—13 to 22 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; very hard, very firm, sticky and plastic; dark grayish brown clay loam surface layer material in filled cracks; common faint clay films on surfaces of peds; slightly effervescent; moderately alkaline; gradual smooth boundary.
- Btk—22 to 34 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; common fine pores; few very fine roots; dark brown surface material in filled cracks; common faint clay films on surfaces of ped; 7 percent threads, films and concretions of calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.
- Bk1—34 to 50 inches; light brown (7.5YR 6/4) silty clay loam, brown (7.5YR 5/4) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; few very fine roots; few very fine pores; dark surface material in filled cracks; many threads and films that contain an estimated 40 percent masses and concretions of calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.
- Bk2—50 to 60 inches; reddish yellow (7.5YR 6/6) clay loam, strong brown (7.5YR 5/6) moist; weak fine subangular blocky structure; contains an estimated 40 to 50 percent by volume of films, threads and concretions of calcium carbonate; strongly effervescent; moderately alkaline; gradual smooth boundary.
- BCK—60 to 80 inches; strong brown (7.5YR 5/6) clay loam, strong brown (7.5YR 4/6) moist; weak fine subangular blocky structure; hard, friable; contains an estimated 40 to 50 percent by volume masses and concretions of calcium carbonate; strongly effervescent; moderately alkaline.

The solum thickness ranges from 60 to more than 80 inches. Depth to the calcic horizon ranges from 19 to 40 inches.

The A horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 2 or 3. Texture is loam. Reaction is neutral or slightly alkaline.

The Bt horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 2 to 3. Texture is clay loam or clay. Clay content ranges from 35 to 45 percent. Reaction is slightly alkaline or moderately alkaline.

The Btk horizon has hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 4 or 6. Texture is clay loam or clay. Reaction is moderately alkaline.

The Bk horizon has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 4 to 6. The calcic horizon has 20 to 50 percent calcium carbonate equivalent. Texture is silty clay loam or clay loam. Reaction is moderately alkaline.

The BCk horizon below the calcic horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma that is dominantly 6. Carbonates in these horizons are thin coatings on ped faces or vertical stringers containing nodular concretions. Reaction ranges from slightly alkaline to strongly alkaline.

Set Series

The Set series is deep over dense clay or noncemented claystone bedrock. These very gently sloping to steep, well drained soils are on backslopes on ridges. These soils are slowly permeable. Slope ranges from 1 to 40 percent. The soils of the Set series are fine-silty, carbonatic, thermic Typic Calciustolls.

Typical pedon of Set clay loam, in an area of Set-Palopinto complex, 8 to 40 percent slopes, extremely stony; from the intersection of Farm Road 1287 and Texas Highway 16 in Graham, 4.6 miles south on Farm Road 1287, 6.2 miles east southeast on Ming Bend Road, 0.6 mile south of Ming Bend Cemetery on ranch road, and 120 feet west in rangeland.

A—0 to 12 inches; dark grayish brown (10YR 4/2) stony clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; hard, firm; common fine and few medium roots; common fine and medium pores; 10 percent of surface is covered by fragments of limestone 10 to 24 inches across and 2 to 8 inches thick; calcareous; moderately alkaline; clear smooth boundary.

Bk1—12 to 26 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; moderate fine subangular blocky structure; hard, firm; few fine and medium roots; common fine and medium pores; 12 percent concretions and masses of calcium carbonate; calcareous; moderately alkaline; gradual wavy boundary.

Bk2—26 to 44 inches; very pale brown (10YR 7/4) clay, yellowish brown (10YR 5/4) moist; moderate fine and medium subangular blocky structure; very hard, firm; few fine roots; few fine pores; 25 percent concretions and masses of calcium carbonate; calcareous; moderately alkaline; gradual wavy boundary.

Cd—44 to 60 inches; light gray (5Y 7/2) noncemented claystone bedrock, light olive gray (5Y 6/2) moist; common medium distinct olive yellow (2.5Y 6/6) mottles; massive parting to fine and medium angular blocky rock like structure; few concretions of calcium carbonate; calcareous; moderately alkaline.

The solum thickness ranges from 40 to 60 inches. The mollic epipedon is 10 to 19 inches thick.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. Texture is silty clay loam, or clay loam or their stony or very stony counterparts. Some pedons contain a few concretions of calcium carbonate. Reaction is moderately alkaline.

The Bk horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 2 to 4. Texture is clay, silty clay, or clay loam. Reaction is moderately alkaline.

The Cd horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 to 6. Texture is dense clay or noncemented claystone bedrock. Some pedons may have thin strata of loamy sediments.

Shatruce Series

The Shatruce series is moderately deep over dense clay or noncemented claystone bedrock. These strongly sloping to very steep, well drained soils are on backslopes on ridges. These soils are slowly permeable. They formed in residuum from noncemented

claystone bedrock. Slope ranges from 8 to 50 percent. The soils of the Shatruce series are fine, mixed, superactive, thermic, Typic Paleustalfs.

Typical pedon of Shatruce gravelly fine sandy loam, 12 to 50 percent slopes, very rubbly; from the intersection of Farm Market Road 2179 and Cliff Drive in Graham, 1.8 miles east on Farm Market Road 2179, 6.6 miles east on Upper Flat Rock Road, 0.5 mile south on pasture road, 0.4 mile west on pasture road, and 85 feet north in range land.

- A—0 to 5 inches; grayish brown (10YR 5/2) gravelly fine sandy loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; slightly hard, friable; common fine roots; common fine pores; 25 percent well rounded gravel; boulders on the surface range from 3 to 15 feet across ; neutral; clear smooth boundary.
- E—5 to 9 inches; very pale brown (10YR 7/4) gravelly fine sandy loam, light yellowish brown (10YR 6/4) moist; weak fine granular structure; slightly hard, friable; common fine roots; common fine pores; 25 percent well rounded gravel; neutral; abrupt smooth boundary.
- Bt1—9 to 21 inches; red (2.5YR 5/6) clay; red (2.5YR 4/6) moist; moderate medium angular blocky structure; very hard, very firm; few fine roots; many distinct clay films on surfaces of peds; moderately acid; gradual wavy boundary.
- Bt2—21 to 27 inches; reddish yellow (5YR 6/6) clay; yellowish red (5YR 5/6) moist; moderate medium angular blocky structure; very hard, very firm; few fine roots; common distinct clay films on surfaces of peds; moderately acid; gradual wavy boundary.
- BCt—27 to 34 inches; reddish yellow (7.5YR 6/6) clay; strong brown (7.5YR 5/6) moist; weak coarse and medium angular blocky structure; very hard, very firm; few fine roots; few distinct clay films on surfaces of peds; moderately acid; gradual wavy boundary.
- Cd—34 to 60 inches; pale yellow (2.5Y 7/4) dense clay, light yellowish brown (2.5Y 6/4) moist; massive; very hard, very firm; slightly alkaline; gradual wavy boundary.

The solum thickness ranges from 20 to 40 inches. Boulders and stones cover from 25 to 70 percent of the soil surface. The surface fragments range from 8 inches to 25 feet across and 4 inches to 8 feet thick. Boulders and stones comprise 0 to 15 percent of the solum. The boulders and stones are silica and iron oxide cemented conglomerates or sandstone.

The A and E horizons are 1 to 20 inches thick. The A horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 4. The E horizon has value 1 to 3 units greater than the A horizon. Reaction ranges from moderately acid to neutral.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 to 6, and chroma of 3 to 8. Texture is clay loam or clay. Clay content ranges from 35 to 50 percent. Stones and fragments comprise 0 to 3 percent of the volume. Reaction ranges from very strongly acid to moderately acid.

The BC horizon ranges from reddish yellow to light olive brown in hues of 7.5YR to 2.5Y, value of 6 or 8, chroma of 3 to 8. In some pedons, there are faint red or brown mottles. Texture is clay loam or clay. Reaction ranges from strongly acid to slightly acid.

The Cd horizon is dense clay or noncemented claystone bedrock and stratified loamy materials in shades of brown, red, or olive. Reaction ranges from very strongly acid to slightly alkaline.

Springcreek Series

The Springcreek series is moderately deep over limestone bedrock. These very gently sloping, well drained soils are on summits on low ridges. These soils are moderately permeable. They formed in loamy residuum from limestone. Slope ranges from 1 to 3 percent. The soils of the Springcreek series are fine-loamy, carbonatic, thermic Typic Calciustolls.

Typical pedon of Springcreek loam, 1 to 3 percent slopes; from the intersection of Farm Road 210 and Ranch Road 2898 south of Spring Creek, 8.5 miles west and north on Farm Road 210, 0.15 mile north on D. Davis Loop, and 30 feet east in rangeland.

A—0 to 8 inches; brown (7.5YR 4/3) loam, dark brown (7.5YR 3/3) moist; moderate very fine subangular blocky and granular structure; slightly hard, friable; strongly effervescent; common fine roots; common wormcasts; 1 percent calcium carbonate concretions; moderately alkaline; clear smooth boundary.

Bk1—8 to 18 inches; brown (7.5YR 4/3) loam, dark brown (7.5YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, friable; few fine roots; common wormcasts; 5 percent limestone fragments and 5 percent limestone cobbles with coatings of calcium carbonates; strongly effervescent; moderately alkaline; gradual smooth boundary.

Bk2—18 to 24 inches; strong brown (7.5YR 5/6) gravelly loam, strong brown (7.5YR 4/6) moist; moderate fine subangular blocky structure; hard, friable; few fine roots; 10 percent limestone gravel; 5 to 10 percent concretions of calcium carbonate; violently effervescent; moderately alkaline; abrupt wavy boundary.

R—24 to 40 inches; indurated, limestone bedrock, coarsely fractured, with coatings of calcium carbonate on surface of bedrock and fractures less than 0.2 inch thick.

The solum thickness ranges from 20 to 40 inches. A thin coating of calcium carbonate is on the bedrock and commonly seals some fractures. Coarse fragments and gravel content range from 0 to 20 percent throughout the solum.

The A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 or 3. Reaction is slightly alkaline or moderately alkaline.

The Bk horizon has hue of 7.5YR to 10YR, value of 3 to 8, and chroma of 2 to 6. Texture is loam, clay loam, or their gravelly counterpart. Reaction is slightly alkaline or moderately alkaline and calcareous.

The R layer is fractured and layered indurated limestone bedrock, in shades of gray or brown.

Throck Series

The Throck series is moderately deep to deep soils over dense clay or claystone bedrock. These very gently sloping or gently sloping, well drained soils are on footslopes on ridges. These soils are slowly permeable. They formed in residuum from dense clay and noncemented claystone bedrock. Slope ranges from 1 to 5 percent slopes. The soils of the Throck series are fine, mixed, active, thermic, Vertic Haplustepts.

Typical pedon of Throck silty clay loam, 1 to 5 percent slopes; from the intersection of Farm Road 209 and Texas Highway 67 in Graham, 13.2 miles west on Farm Road 209, and 50 feet north in rangeland.

A—0 to 4 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist, moderate fine and medium subangular blocky structure parting to moderate fine and medium granular; hard, firm; many fine and medium roots; many fine and medium pores; 2 percent calcium carbonate concretions; slightly effervescent; moderately alkaline; clear smooth boundary.

Bk1—4 to 22 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; few fine faint dark grayish brown (10YR 4/2) organic stains; moderate medium angular blocky structure; very hard, very firm; sticky and plastic; common fine roots; common fine pores; 1 percent siliceous pebbles; few slickensides and pressure faces; 9 percent calcium carbonate films, threads, soft masses and concretions; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bk2—22 to 40 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; few fine distinct gray (10YR 6/1), few fine prominent weak red (2.5YR 4/2)

mottles; moderate medium angular blocky structure; very hard, very firm; sticky and plastic; few fine roots; few fine pores; 1 percent siliceous pebbles; few slickensides and pressure faces; 10 percent calcium carbonate films, threads, soft masses and concretions; violently effervescent; moderately alkaline; gradual wavy boundary.

BCK—40 to 48 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; many distinct gray (10YR 6/1) mottles; common distinct reddish brown (2.5YR 4/4) hematite soft masses; moderate medium angular blocky structure; very hard, very firm; sticky and plastic; few slickensides and pressure faces; few fine roots; few fine pores; 10 percent calcium carbonate films, threads, soft masses and concretions; strongly effervescent; moderately alkaline; clear smooth boundary.

Cd1—48 to 58 inches; gray (5Y 6/1) noncemented claystone bedrock, gray (5Y 5/1) moist; common medium distinct reddish yellow (7.5YR 6/6), few fine distinct light brownish gray (2.5Y 6/2), few fine faint gray (10YR 6/1) mottles; massive; few fine prominent reddish brown (2.5YR 4/4) hematite soft masses; 2 percent gypsum crystals; 1 percent calcium carbonate concretions; very slightly effervescent; slightly alkaline; gradual wavy boundary.

Cd2—58 to 80 inches; gray (10YR 6/1) noncemented claystone bedrock, gray (10YR 5/1) moist; common medium distinct reddish yellow (7.5YR 6/6), few fine distinct light brownish gray (2.5Y 6/2), few fine faint gray (7.5YR 6/1) mottles, few fine prominent reddish brown (2.5YR 4/4) hematite soft masses; massive; 2 percent gypsum crystals; 1 percent calcium carbonate concretions; noneffervescent; slightly alkaline.

The solum thickness ranges from 30 to 60 inches. Clay content of the control section ranges from 35 to 60 percent.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. Reaction is slightly alkaline or moderately alkaline.

The Bk and BCK horizons have hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 3 to 6. Some pedons have mottles in shades of gray or red. Clay content of the control section ranges from 40 to 60 percent. Calcium carbonate equivalent range from 15 to 40 percent. Reaction is moderately alkaline.

The BCK horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4.

The Cd horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 to 6. Texture is dense clay or noncemented claystone bedrock.

Thurber Series

The Thurber series is very deep, very gently sloping, moderately well drained soils on toeslopes on ridges. These soils are very slowly permeable. They formed in slope alluvium from Pennsylvanian sediments. Slope ranges from 0 to 3 percent. The soils of the Thurber series are fine, smectitic, thermic Typic Haplustalfs.

Typical pedon of Thurber clay loam, 1 to 3 percent slopes; from the intersection of Texas Highway 16 and Farm Road 1287 in Graham, 7.3 miles south on Texas Highway 16, and 375 feet east of Texas Highway 16 in improved pasture.

Ap—0 to 8 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure parting to weak coarse platy; hard, firm; few fine and medium roots; slightly alkaline; clear wavy boundary.

Bt—8 to 18 inches; dark yellowish brown (10YR 4/4) clay loam, dark yellowish brown (10YR 3/4) moist; weak coarse prismatic structure parting to weak medium subangular blocky structure; hard, firm; few fine roots; common faint clay films on surfaces of peds; moderately alkaline; clear wavy boundary.

Btk1—18 to 31 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; moderate coarse prismatic structure parting to moderate medium angular blocky; very hard,

very firm; few fine roots; common faint clay films on surfaces of peds; 5 percent films, threads, and masses of calcium carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.

Btk2—31 to 61 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; weak coarse prismatic structure parting to moderate medium angular blocky; very hard, very firm; few fine roots; few faint clay films on surfaces of peds; 10 percent films, threads, and concretion of calcium carbonate; 1 percent ferro-manganese concretions; strongly effervescent; moderately alkaline; gradual wavy boundary.

BC—61 to 80 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; weak fine angular blocky structure parting to weak fine subangular blocky; hard, firm; few very fine roots; 2 percent films threads, and concretions of calcium carbonate; 2 percent ferro-manganese concretions; slightly effervescent; moderately alkaline.

The solum thickness is more than 60 inches.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Surface horizons are hard and massive when dry. Reaction ranges from slightly acid to slightly alkaline.

The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. Texture is clay loam or clay. Reaction is neutral or slightly alkaline.

The Btk, Bck and BC horizons have hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. Texture is loam, sandy clay loam, clay loam, or clay. Reaction is slightly alkaline or moderately alkaline.

Tillman Series

The Tillman series is very deep, nearly level or very gently sloping, well drained soils on toeslopes on ridges. These soils are slowly permeable. They formed in calcareous, clayey alluvial materials. Slope ranges from 1 to 3 percent. The soils of the Tillman series are fine, mixed, superactive, thermic Vertic Paleustolls.

Typical pedon of Tillman clay loam, 1 to 3 percent slopes; from the intersection of Farm Road 210 and Texas Highway 79 in Olney, 7.8 miles west on Farm Road 210, 1.35 miles south on Swink Road, and 110 feet west of county road in cropland.

Ap—0 to 7 inches; brown (7.5YR 5/2) clay loam, dark brown (7.5YR 3/2) moist; weak fine subangular blocky structure parting to weak fine granular; hard, firm; common fine roots; common fine pores; few wormcasts; few siliceous pebbles on surface and in soil; moderately alkaline; abrupt smooth boundary.

Bt1—7 to 14 inches; reddish brown (5YR 4/3) clay, dark reddish brown (5YR 3/3) moist; moderate coarse and medium subangular blocky structure; very hard, firm; few fine roots; common fine pores; common faint clay films on surfaces of peds; few wormcasts; moderately alkaline; clear smooth boundary.

Bt2—14 to 22 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; strong medium subangular blocky structure; very hard, firm; few very fine roots; common faint clay films on surfaces of peds; 5 percent calcium carbonate concretions, 1 percent threads and films of calcium carbonate; slightly effervescent; moderately alkaline; clear smooth boundary.

Btk1—22 to 36 inches; reddish brown (5YR 5/4) clay, dark reddish brown (5YR 3/4) moist; strong coarse and medium subangular blocky structure; very hard, very firm; few fine roots; common very fine pores; few faint clay films on surfaces of peds; 14 percent films, threads, masses and concretions of calcium carbonate; strongly effervescent; moderately alkaline; gradual smooth boundary.

Btk2—36 to 48 inches; reddish yellow (5YR 6/6) clay, yellowish red (5YR 4/6) moist; moderate coarse and medium subangular blocky structure; very hard, firm; few

fine roots; few faint clay films on surfaces of peds; 5 percent films, threads, masses, and cemented calcium carbonate concretions; common fine pores; strongly effervescent; moderately alkaline; gradual smooth boundary.

Btk3—48 to 62 inches; yellowish red (5YR 5/6) clay, yellowish red (5YR 4/6) moist; moderate fine and medium subangular blocky structure; very hard, very firm; few fine roots; few fine pores; few faint clay films on surfaces of peds; 5 percent distinct coatings of calcium carbonate concretions and masses; strongly effervescent; moderately alkaline; abrupt smooth boundary.

BCK—62 to 80 inches; red (2.5YR 5/6) clay, red (2.5YR 4/6) moist; weak fine and medium subangular blocky structure; very hard, very firm; 5 percent weak and strongly cemented calcium carbonate concretions; strongly effervescent; moderately alkaline, abrupt smooth boundary.

The solum thickness ranges from 60 to more than 80 inches. Secondary calcium carbonate is within 24 inches of the surface. A calcic horizon, where present, is below 40 inches.

The A horizon has hue of 7.5YR, value of 3 to 5, and chroma of 2 or 3. The A horizon is 5 to 16 inches thick. Reaction ranges from neutral to moderately alkaline.

The Bt or Btk horizon has hue of 2.5YR or 5YR, value of 4 to 6, and chroma of 3 or 6. Texture is clay loam or clay. Reaction is slightly alkaline or moderately alkaline.

The BCK horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 or 6. Texture is clay. Reaction is slightly alkaline or moderately alkaline.

Truce Series

The Truce series is deep over dense clay or noncemented claystone bedrock. These very gently or gently sloping, well drained soils are on footslopes on ridges. These soils are slowly permeable. They formed in residuum from Pennsylvanian noncemented claystone bedrock. Slope ranges from 1 to 5 percent. The soils of the Truce series are fine, mixed, active, thermic Udic Paleustalfs.

Typical pedon of Truce fine sandy loam, 1 to 3 percent slopes; from the intersection of Texas Highway 114 and Farm Road 1769 in Jean, 1.3 miles east on Texas Highway 114, 2.2 miles south on Taylor Road, and 0.4 mile northwest in old field.

Ap—0 to 5 inches; light brown (7.5YR 6/4) fine sandy loam, brown (7.5YR 5/4) moist; moderate fine and medium subangular blocky structure parting to moderate medium granular; slightly hard, friable; common fine and medium roots; common fine and medium pores; neutral; clear smooth boundary.

Bt1—5 to 18 inches; reddish brown (5YR 4/4) clay loam, dark reddish brown (5YR 3/4) moist; moderate medium angular blocky structure parting to moderate fine and medium subangular blocky; hard, firm; few fine roots; few fine pores; common distinct clay films on surfaces of peds; slightly alkaline; gradual smooth boundary.

Bt2—18 to 30 inches; brown (7.5YR 5/4) clay, brown (7.5YR 4/4) moist; few fine faint, strong brown (7.5YR 5/6) mottles; moderate medium angular blocky structure parting to moderate fine and medium subangular blocky; hard, firm; few fine roots; few fine pores; common distinct clay films on surfaces of peds; 1 percent ferro-manganese concretions; moderately alkaline; gradual smooth boundary.

Bt3—30 to 46 inches; yellowish brown (10YR 5/6) clay loam, dark yellowish brown (10YR 4/6) moist; moderate medium angular blocky structure parting to weak fine subangular blocky; hard, firm; few fine roots; few faint clay films on surfaces of peds; few organic stains, brown (10YR 4/3), in root channels; few fine faint, brown (10YR 5/3), few fine prominent, reddish brown (2.5YR 4/4) masses of oxidized iron; 1 percent ferro-manganese concretions; moderately alkaline; gradual wavy boundary.

BCt—46 to 56 inches; yellowish brown (10YR 5/6) clay; dark yellowish brown (10YR 4/6) moist; few fine faint strong brown (10YR 5/6), few fine prominent light reddish brown (2.5YR 6/3) mottles; weak fine and medium subangular blocky structure; hard, firm; few fine roots; few faint clay films on surfaces of peds; few organic stains, very dark grayish brown (10YR 3/2) in root channels; 3 percent sandstone fragment; moderately alkaline; gradual wavy boundary.

Cd—56 to 80 inches; pale yellow (2.5Y 7/3) noncemented claystone bedrock, light yellowish brown (2.5Y 6/3) moist; common medium distinct brownish yellow (10YR 6/6), and few fine distinct, white (10YR 8/2) mottles; massive; hard, firm; few discontinuous layers of sandstone; 5 percent calcium carbonate concretions; moderately alkaline.

The solum thickness ranges from 40 to 60 inches. However the E horizon may be absent where plowing has mixed the A and the E horizons.

The A horizon has hue 7.5YR or 10YR, value of 4 to 6, and chroma of 2 to 4. The E horizon, where present, is 1 or 2 units of value higher in color than the A horizon. Reaction is slightly acid or neutral.

The Bt1 horizon has hue of 5YR, value of 4 or 5, and chroma of 3 to 6. Texture is clay loam or clay. Reaction ranges from slightly acid to slightly alkaline.

The lower Bt horizons have hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 or 6. Texture is clay loam or clay. Some pedons have mottles in shades of red, brown, or olive. Reaction ranges from neutral to moderately alkaline.

The BCt horizon has hue of 7.5YR to 2.5Y, value of 6 or 8, chroma of 3 to 8. Texture is clay loam or clay. Reaction ranges from neutral to moderately alkaline.

The Cd horizon has colors in shades of brown, yellow, olive, or gray. Texture is dense clay or noncemented claystone bedrock. Some pedons have thin discontinuous layers of sandstone. Reaction ranges from neutral to moderately alkaline and is typically calcareous.

Vernon Series

The Vernon series is moderately deep over noncemented claystone bedrock. These gently sloping to steep, well drained soils are on footslopes on ridges. These soils are very slowly permeable. They formed in residuum from Permian claystone bedrock. Slope ranges from 1 to 30 percent. The soils of the Vernon series are fine, mixed, active, thermic Typic Haplustepts.

Typical pedon of Vernon clay, 1 to 5 percent slopes; from the intersection of Farm Road 210 and Texas Highway 79 in Olney, 7.8 miles west on Farm Road 210, 0.8 mile south on Swink Road, and 400 feet west in rangeland.

A—0 to 6 inches; reddish brown (5YR 5/3) clay, reddish brown (5YR 4/3) moist; weak fine and medium angular blocky structure; very hard, very firm; few fine and medium roots; few fine and medium calcium carbonate concretions; slightly effervescent; moderately alkaline; clear smooth boundary.

Bk—6 to 28 inches; reddish brown (5YR 5/3) clay, reddish brown (5YR 4/3) moist; common distinct light yellowish brown (2.5Y 6/4) and reddish brown (2.5YR 4/4) claystone fragments; moderate coarse and medium subangular blocky structure; very hard, very firm; few very fine and medium roots; common distinct pressure faces; common fine calcium carbonate concretions; slightly effervescent; moderately alkaline; clear smooth boundary.

Cd—28 to 60 inches; reddish brown (2.5YR 4/3) noncemented claystone bedrock, dark reddish brown (2.5YR 3/3) moist; moderate medium angular rock-like structure parting to fine angular blocks, light yellowish brown (2.5Y 6/4); massive; extremely hard, extremely firm; slightly effervescent, slightly alkaline.

The solum thickness ranges from 20 to 40 inches. Typically, the soil is calcareous throughout. Ironstone gravel on the surface ranges from 0 to 15 percent by volume.

The A horizon has hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma 2 to 4. The A horizon ranges from 3 to 12 inches in thickness. Reaction is slightly alkaline or moderately alkaline.

The Bk horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 3 to 6. Texture is clay. Reaction is moderately alkaline.

The Cd horizon has hue of 2.5YR or 5YR, value of 4 to 6, and chroma of 3 to 6. Texture is dense clay or noncemented claystone bedrock.

Westola Series

The Westola series is very deep, nearly level, well drained soils on flood plains. These soils are moderately rapid permeable. They formed in alluvium along the Brazos and Clear Fork Rivers. Slope ranges from 0 to 1 percent. The soils of the Westola series are coarse-loamy, mixed, superactive, calcareous, thermic Typic Ustifluvents.

Typical pedon of Westola fine sandy loam, 0 to 1 percent slopes, occasionally flooded; from the intersection of Farm Road 926 and U.S. Highway 251 in Newcastle, 4.4 miles west on Farm Road 926, 0.5 mile south on a gravel pit road, 0.3 mile southeast on road from rock pit, 122 feet east along fence line, and 35 feet south of east-west fence line in rangeland.

A1—0 to 5 inches; reddish yellow (5YR 6/6) fine sandy loam, yellowish red (5YR 5/6) moist; weak fine and medium subangular blocky structure; slightly hard, friable; many fine and medium roots; common fine pores; slightly effervescent; moderately alkaline; clear smooth boundary.

A2—5 to 8 inches; reddish brown (5YR 5/4) silt loam, reddish brown (5YR 4/4) moist; weak medium subangular blocky; hard, firm; few fine roots; few fine pores; slightly effervescent; moderately alkaline; clear smooth boundary.

C1—8 to 21 inches; reddish yellow (5YR 6/6) very fine sandy loam, yellowish red (5YR 5/6) moist; massive; slightly hard, friable; common fine and medium roots; few fine pores; strongly effervescent; moderately alkaline; gradual smooth boundary.

C2—21 to 32 inches; reddish yellow (5YR 6/6) fine sandy loam, yellowish red (5YR 5/6) moist; massive; slightly hard, friable; few fine roots; strongly effervescent; moderately alkaline; gradual smooth boundary.

C3—32 to 55 inches; reddish yellow (5YR 6/6) fine sandy loam, yellowish red (5YR 5/6) moist; massive; slightly hard, friable; few fine roots; strongly effervescent; moderately alkaline; gradual smooth boundary.

C4—55 to 80 inches; reddish yellow (5YR 6/6) fine sandy loam, yellowish red (5YR 5/6) moist; massive; slightly hard, friable; few very fine roots; strongly effervescent; moderately alkaline.

The solum thickness is more than 80 inches. Clay content of the control section ranges from 5 to 18 percent clay.

The A horizon has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 2 to 6. Reaction is slightly alkaline or moderately alkaline.

The C horizon has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 4 or 6. Texture is very fine sand loam, fine sandy loam, or loam. Thin strata of coarser or finer materials occur throughout the C horizon. Reaction is slightly alkaline or moderately alkaline.

Weswind Series

The Weswind series is very deep, very gently sloping, moderately well drained soils on footslopes on ridges. These soils are moderately slowly permeable. They formed in loamy and clayey residuum from sandstone and claystone. Slope ranges from 1 to 3 percent. The soils of the Weswind series are fine, mixed, semiactive, thermic, Typic Paleustalfs. (Fig. 14)

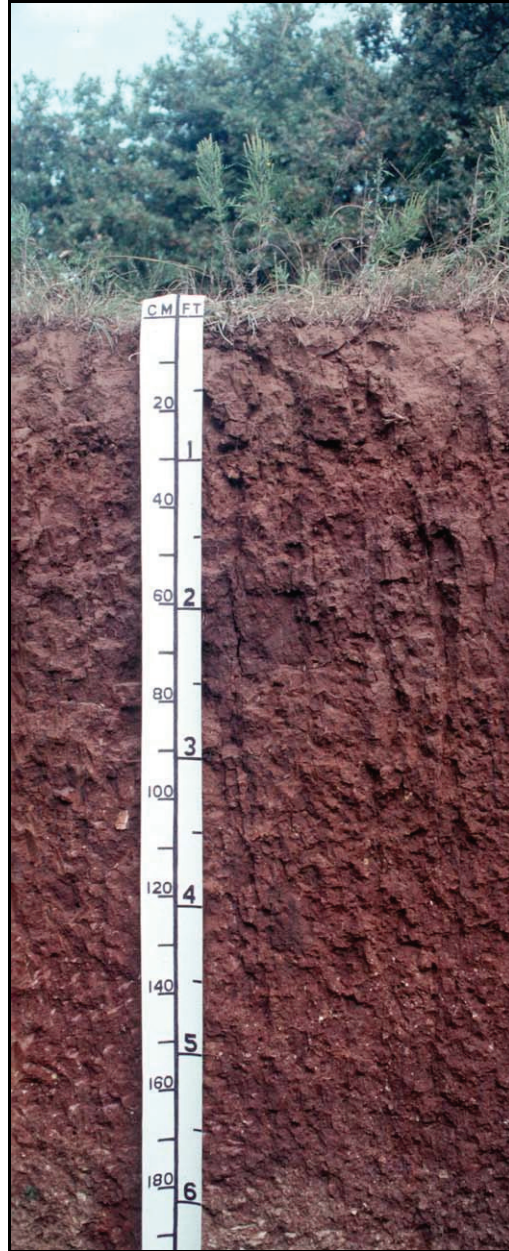


Figure 14.—Profile of Weswind fine sandy loam, 1 to 3 percent slopes. The argillic horizon, at a depth of 11 inches is sandy clay loam. The red colors are inherited from the Permian parent material.

Soil Survey of Young County, Texas

Typical pedon of Weswind fine sandy loam, 1 to 3 percent slopes; from the intersection of Farm Road 1769 and Texas Highway 16 in Markley, 4.1 west on Farm Road 1769, 0.75 mile north and 0.5 mile east on ranch road, and 75 feet north in rangeland.

- A1—0 to 4 inches; brown (7.5YR 5/3) fine sandy loam, brown (7.5YR 4/3) moist; weak medium and coarse subangular blocky structure; hard, friable; many fine and medium roots; few fine and medium pores; slightly acid; clear smooth boundary.
- A2—4 to 11 inches; brown (7.5YR 5/3) fine sandy loam, brown (7.5YR 4/3) moist; weak medium and coarse subangular blocky structure; hard, friable; common fine and medium roots; few fine and medium pores; slightly acid; abrupt smooth boundary.
- Bt1—11 to 17 inches; brown (7.5YR 5/4) sandy clay loam, brown (7.5YR 4/4) moist; moderate coarse prismatic structure parting to moderate medium angular blocky; very hard, very firm; few fine and medium roots; few fine and medium pores; common distinct clay films on surfaces of peds; few fine ferro-manganese concretions; few wormcasts; slightly acid; clear smooth boundary.
- Bt2—17 to 25 inches; brown (7.5YR 4/3) clay, dark brown (7.5YR 3/3) moist; moderate coarse prismatic structure parting to moderate medium angular blocky; very hard, very firm; few fine and medium roots; few fine and medium pores; common distinct dark brown (7.5YR 3/2) clay films on surfaces of peds; 1 to 2 percent ferro-manganese concretions; neutral; clear smooth boundary.
- Bt3—25 to 31 inches; brown (7.5YR 4/4) clay loam, dark brown (7.5YR 3/4) moist; moderate coarse prismatic structure parting to moderate fine and medium angular blocky; very hard, very firm; few fine roots; common distinct dark brown (7.5YR 3/2) clay films on surfaces of peds; 1 percent fine ferro-manganese concretions; slightly alkaline; gradual smooth boundary.
- Bt4—31 to 46 inches; brown (7.5YR 5/4) clay, brown (7.5YR 4/4) moist; moderate coarse prismatic structure parting to moderate fine and medium angular blocky; very hard, very firm; few fine roots; common distinct clay films on surfaces of peds; few medium faint strong brown (7.5YR 5/6) masses of oxidized iron; 1 percent fine ferro-manganese concretions; few pressure faces and small slickensides; slightly alkaline; gradual smooth boundary.
- Bt5—46 to 67 inches; brown (7.5YR 4/4) clay, dark brown (7.5YR 3/4) moist; moderate coarse prismatic structure parting moderate fine angular blocky; very hard, firm; few fine and medium roots; common distinct clay films on surfaces of peds; common fine distinct dark red (2.5YR 3/6) and few fine distinct light yellowish brown (10YR 6/4) masses of oxidized iron; 1 to 2 percent ferro-manganese concretions; 1 to 2 percent calcium carbonate concretions; slightly alkaline; clear smooth boundary.
- BCt—67 to 80 inches; reddish brown (5YR 5/4) clay, reddish brown (5YR 4/4) moist; moderate coarse prismatic structure parting to moderate fine and coarse angular blocky; very hard, firm; few fine and medium roots; common distinct clay films along prism faces; coatings of A material along vertical surfaces of prisms; many medium prominent light yellowish brown (2.5Y 6/3) moist, common fine distinct yellow (10YR 7/6) masses of oxidized iron; moderately alkaline; clear smooth boundary.

The solum thickness ranges from 60 to more than 80 inches. Clay content of the control section ranges from 35 to 45 percent. Concretions and masses of calcium carbonate are generally below 50 inches, where present, but can range up to 30 inches.

The A horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. Reaction is slightly acid or moderately acid.

The Bt1 horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 4 or 6. Texture is sandy clay loam, clay loam, or clay. Reaction is slightly acid or neutral.

The lower Bt2, Bt3, Bt4, and Bt5 horizons have hue of 5YR to 10YR, value of 4 or 5, and chroma of 4 to 8. Faint to prominent mottles in shades of red, yellow, or brown, range from 1 to 20 percent. Texture is clay loam, sandy clay, or clay. Dark concretions and masses range from 2 to 12 percent by volume. Some pedons contain films and threads, soft masses, or concretions of secondary calcium carbonate. Reaction ranges from neutral to moderately alkaline.

The BCt horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. Mottles in shades of yellow, olive, or gray range from few to many. Calcium carbonate in the form of soft masses and films and threads make up 5 to 10 percent of the total volume of this horizon.

Wheatwood Series

The Wheatwood series is very deep, nearly level, well drained soils on flood plains. These soils are moderately permeable. They formed in calcareous loamy alluvium. Slope ranges from 0 to 1 percent. The soils of the Wheatwood series are fine-silty, mixed, active, thermic Fluventic Haplustepts. (Fig. 15)

Typical pedon of Wheatwood loam, 0 to 1 percent slopes, occasionally flooded; from the intersection of Farm Road 1974 and Farm Road 701 in Eliasville, 0.5 mile west on Farm Road 1974, 2.9 miles north on Farm Road 3109 to east field gate, 0.4 mile southeast on field road, and 0.4 mile northeast in rangeland.

Ap—0 to 6 inches; light brown (7.5YR 6/4) loam, brown (7.5YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable; many fine, medium and few coarse roots; few fine and medium tubular pores; strongly effervescent, moderately alkaline; clear smooth boundary.

Bw—6 to 14 inches; light brown (7.5YR 6/4) loam, brown (7.5YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable; many fine, medium and few large roots; few fine and medium tubular pores; few wormcasts; strongly effervescent; moderately alkaline; clear smooth boundary.

Ab—14 to 23 inches; brown (7.5YR 5/4) clay loam, dark brown (7.5YR 3/4) moist; weak medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, very friable; common very fine, fine and few medium and large roots; many fine and few medium pores; few films and threads of calcium carbonate; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk1—23 to 37 inches; light brown (7.5YR 6/4) clay loam, brown (7.5YR 4/4) moist; weak medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, very friable; many fine and few medium roots; many fine and few medium pores; few thin clay films on some ped surfaces; common films and threads of calcium carbonate; common wormcasts; few discontinuous thin strata (less than 0.5 inch) of weak red (2.5YR 4/2) very fine sandy loam; strongly effervescent, strongly alkaline; gradual smooth boundary.

Bk2—37 to 51 inches; light brown (7.5YR 6/4) clay loam, brown (7.5YR 4/4) moist; weak medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, very friable; many fine and few medium roots; many fine and few medium pores; common films and threads of calcium carbonate; common wormcasts; few discontinuous thin strata (less than 0.5 inch) of weak red (2.5YR 4/2) very fine sandy loam; strongly effervescent; strongly alkaline; gradual smooth boundary.

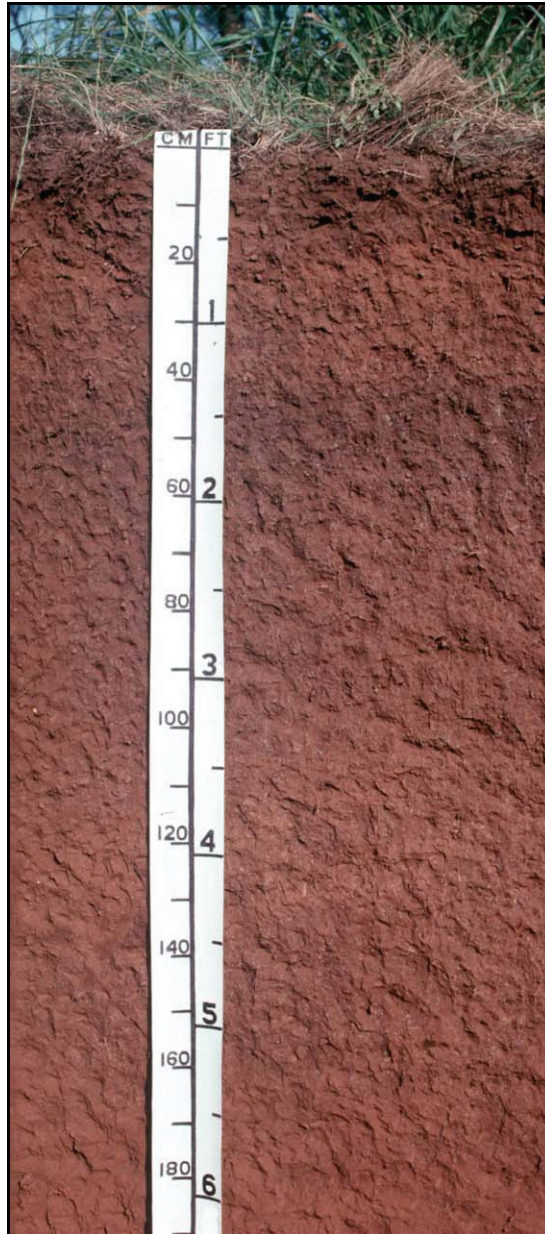


**Figure 15.—Profile of Wheatwood loam, 0 to 1 percent slopes.
Wheatwood soils developed on flood plains, are well drained,
and moderately permeable.**

Bk3—51 to 71 inches; light brown (7.5YR 6/4) loam, brown (7.5YR 4/4) moist; weak medium prismatic structure parting to moderate fine subangular blocky; slightly hard, very friable; many fine and few medium roots; many fine and few medium pores; few thin clay films on some ped surfaces; common films and threads of calcium carbonate; common wormcasts; few discontinuous thin stratas (less than 0.5 inch) of weak red (2.5YR 4/2) very fine sandy loam; strongly effervescent; moderately alkaline; clear smooth boundary.

Bk4—71 to 80 inches; reddish yellow (7.5YR 6/6) very fine sandy loam, strong brown (7.5YR 5/6) moist; weak medium prismatic structure parting to weak fine subangular blocky; slightly hard, very friable; few very fine and fine roots; many

fine and few medium pores; few thin clay films on surfaces of prisms; common films and threads of calcium carbonate; strongly effervescent; strongly alkaline.

The solum thickness ranges from 60 to more than 80 inches. The 10- to 40-inch control section is loam, silt loam, silty clay loam, and clay loam with 20 to 35 percent clay. Thin stratification of very fine sandy loam is common below a depth of 20 inches.

The A horizon has hue of 5YR or 7.5YR, value of 4 to 6, and chroma 2 to 4. Reaction is moderately alkaline.

The Bw and Bk horizons have hue of 5YR or 7.5YR, value 4 to 6, and chroma 4 to 6. Texture is silt loam, silty clay loam, or clay loam. Reaction is moderately alkaline.

The BC or C horizons, where present, have hue of 5YR or 7.5YR, value 4 to 6, and chroma 4 or 6. The C horizon is weakly structured, structureless, or stratified with textures that range from very fine sandy loam to silty clay loam. Reaction is moderately alkaline.

Wichita Series

The Wichita series is very deep, very gently sloping, well drained soils on stream terraces. These soils are moderately slowly permeable. They formed in loamy and clayey alluvium. Slope ranges from 1 to 3 percent. The soils of the Wichita series are fine, mixed, superactive, thermic Typic Paleustalfs.

Typical pedon of Wichita clay loam, 1 to 3 percent slopes; from the intersection of U.S. Highway 380 and U.S. Highway 183 in Throckmorton, 7.9 miles east on U.S. Highway 380, 1.7 miles south on county road, 1.5 miles east and 30 feet east in rangeland.

A—0 to 5 inches; brown (7.5YR 4/4) clay loam, dark brown (7.5YR 3/4) moist; weak medium subangular blocky structure; slightly hard, friable; common fine and medium roots; few calcium carbonate concretions less than 0.25 inch across; neutral; gradual smooth boundary.

Bt—5 to 21 inches; reddish brown (5YR 4/4) clay loam, dark reddish brown (5YR 3/4) moist; moderate coarse and medium subangular blocky structure; very firm, very hard; common fine and medium roots; common distinct clay films on surfaces of peds, few calcium carbonate concretions to less than 0.25 inch across; strongly effervescent; neutral; gradual smooth boundary.

Btk1—21 to 31 inches; yellowish red (5YR 5/6) clay loam, yellowish red (5YR 4/6) moist; moderate medium subangular and blocky structure; very hard, very firm; few fine and medium roots; common distinct clay films on surfaces of peds; few calcium carbonate concretions and many masses less than 1 inch across; strongly effervescent; moderately alkaline.

Btk2—31 to 68 inches; reddish yellow (5YR 6/6) clay loam, dark yellowish red (5YR 4/6) moist; moderate medium subangular blocky structure: very hard, very firm; few fine and medium roots; common distinct clay films on ped surfaces; 4 percent calcium carbonate concretions and 10 percent masses; strongly effervescent; moderately alkaline.

BCK—68 to 80 inches; reddish yellow (5YR 6/6) clay loam, yellowish red (5YR 5/6) moist; massive; hard, friable; 5 percent films and threads, and 5 percent masses of calcium carbonate; strongly effervescent; moderately alkaline.

The solum thickness is 60 to more than 80 inches. Secondary carbonates begin at 8 to 28 inches. Calcic horizons occur at a depth of 40 to 60 inches.

The A horizon has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 2 to 4. The A horizon is 5 to 10 inches thick. Reaction is neutral or slightly alkaline.

The Bt and Btk horizons have hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 4 or 6. The Bt and Btk horizons range from 26 to 68 inches thick. Texture is clay loam or clay, with a clay content of 35 to 45 percent. Reaction is neutral to moderately alkaline.

The BCk horizon, where present, has hue of 2.5YR or 5YR, value of 3 to 6, and chroma of 6. Texture is clay loam, clay, or silty clay. Some pedons have strata of loam or fine sandy loam. Carbonates are less than 1 percent to 5 percent. Reaction is moderately alkaline.

Winters Series

The Winters series is very deep, very gently sloping, well drained soils on stream terraces. These soils are moderately slowly permeable. They formed in loamy and clayey alluvium. Slope ranges from 1 to 3 percent. The soils of the Winters series are fine, mixed, superactive, thermic Typic Paleustalfs.

Typical pedon of Winters loam, 1 to 3 percent slopes; from the intersection of Farm Road 701 and Texas Highway 67 in South Bend, 1.5 miles west on Farm Road 701, and 250 feet south in rangeland.

A—0 to 10 inches; brown (7.5YR 5/4) loam, dark brown (7.5YR 3/4) moist; moderate fine and medium subangular blocky structure parting to weak fine granular; hard, friable; common fine roots; common fine pores; few siliceous gravels; neutral; clear smooth boundary.

Bt1—10 to 19 inches; reddish brown (5YR 4/4) clay loam, dark reddish brown (5YR 3/4) moist; weak fine subangular blocky structure; hard, firm; common fine roots; few pores; common distinct clay films on surfaces of peds; few siliceous pebbles; slightly alkaline; clear smooth boundary.

Bt2—19 to 33 inches; reddish brown (5YR 4/4) clay, dark reddish brown (5YR 3/4) moist; moderate medium subangular blocky structure; hard, firm; few fine roots; few very fine pores; common distinct clay films on surfaces of peds; few wormcasts; slightly alkaline; gradual smooth boundary.

Bt3—33 to 50 inches; yellowish red (5YR 5/6) clay loam, yellowish red (5YR 4/6) moist; moderate medium subangular blocky structure; hard, firm; few very fine roots; common fine pores; common distinct clay films on surfaces of peds; slightly alkaline; gradual smooth boundary.

Btk—50 to 80 inches; reddish yellow (5YR 6/6) clay loam, yellowish red (5YR 4/6) moist; weak fine and medium subangular blocky structure; hard, firm; few faint clay films on surfaces of peds; few films and threads of calcium carbonate; very slightly effervescence; moderately alkaline.

The solum thickness is more than 60 inches. Depth to secondary carbonates is 30 to 50 inches. A calcic horizon, where present, is at depths greater than 45 inches.

The A horizon has hue of 7.5YR, value of 3 to 5, and chroma of 4. Reaction ranges from moderately acid to slightly alkaline.

The Bt and Btk horizons have hue of 5YR, value of 3 to 6, and chroma of 4 or 6. Texture is clay loam or clay. Reaction ranges from slightly acid to moderately alkaline.

Formation of the Soils

In this section the factors of soil formation are described and related to the formation of the soils of Young County. Also, the processes of soil formation and the surface geology of the county are described.

Factors of Soil Formation

A soil is a three-dimensional natural body consisting of mineral and organic material that can support plant growth. The nature of any soil at a given site is the result of the interaction of five general factors-parent material, climate, plants and animals, relief, and time. Climate, plants and animals can have an affect on parent material that is modified by relief over time. Theoretically, if all these factors were identical at different sites, the soils at these sites would be identical. Differences among the soils are caused by variations in one or more of these factors.

Climate

The climate of Young County is humid. Rainfall, evaporation, and temperature are the main climatic influences. The moderate amount of rainfall has promoted moderately rapid soil development throughout the survey area. Rainfall is uniform over the area, although its effect is modified locally by runoff caused by slope. Because of the uniformity in climate, the differences between soils are not attributed to climatic differences.

Plant and Animal Life

The vegetation under which a soil forms influences soil properties, such as color, structure, reaction, and content and distribution of organic matter. Vegetation extracts water from the soil, recycles nutrients, and adds organic matter to the soil. Gases derived from root respiration combine with water to form acids that influence the weathering of minerals. Because of a lower content of organic matter, soils that formed under forest vegetation are generally light colored than those formed under grasses.

Bacteria, fungi, and many other microorganisms decompose organic matter and release nutrients to growing plants. They influence the formation of soil structure. Soil properties, such as drainage, temperature, and reaction, influence the type of microorganisms that live in the soil. Fungi are generally more active in acid soils, while bacteria are more active in less acid and, more alkaline soils.

Earthworms, insects, and small burrowing animals mix the soil and create small channels that aid in the soil aeration and water movement. Earthworms help to incorporate crop residue or other organic matter into the soil. The organic matter improves tilth. In areas that are well populated with earthworms, the leaf litter that accumulates is generally incorporated into the soil by the following spring. If the earthworm population is low, part of the leaf can remain on the surface for several years.

Human activity can significantly influence soil formation. The clearing of native forests followed by continuous farming may drastically change activities within the soil. Cultivation generally accelerates erosion on sloping soils, affects soil structure and compacting, and lowers the content of organic matter. Drainage of wet soil changes soil formation. Fertilizer, lime, and pesticide also affect soil formation. Developing land for urban uses or for mining significantly influences soil development.

Time

The length of time that climate, living organisms, and relief act upon the parent material affects the kind of soil that forms. The effects of time are modified by the other four factors of soil formation. In general, however, soils that do not have definite horizons are young or immature. Soils that have well-defined horizons are old or mature.

The soils in Young County range from young to old. Westola, Wheatwood, and Clearfork soils are on flood plains and have little soil horizon development. Sagerton, Tillman, and Thurber soils in the uplands are older soils that have distinct horizon development and have little resemblance to the original parent material.

Parent Material

Parent material is the unconsolidated mass from which a soil forms (Soil Survey Manual, 1993). Parent material, in conjunction with climate, plant and animal life, time, and topography has a major influence on the chemical and mineral composition of soil. The ultimate source of mineral parent material is from weathered sedimentary, igneous or metamorphic rock. The organic fraction of parent material is derived from vegetation.

Water, wind, and gravity have been the primary transport and depositional agents of geologic strata and parent materials in Young County. Depositional environment, in conjunction with sediment origins and time, determines lithic and mineral characteristics of the sediments, which eventually are the source of soil parent materials. Pennsylvanian and Permian age fluvial, delta, and shallow marine sediments comprise most of the outcrops in Young County. Quaternary sand and gravel were deposited during the Pleistocene and Holocene epochs on the higher fluvial terrace levels along major streams. Holocene alluvial clay, sand, and gravel include modern alluvial deposits on flood plains and the lowest terrace level along smaller streams. Eolian silt and sand derived from flood plains and Pleistocene terraces are present on uplands in the extreme north-central sector of Young County.

Young County upland soils have developed from parent materials that are essentially weathered residuum from underlying Pennsylvanian and Permian age sedimentary bedrock and, in some localities, a relict mantle of sediment deposited during the Pleistocene epoch. Soils on steeper slopes are affected to varying degrees by creep and colluvial processes. This movement has not, however, been significant enough to destroy the residual effects of parent material sources.

Conversely, Pleistocene terrace and Holocene flood plain soils and their parent materials are not necessarily a product of the underlying bedrock. These alluvial soils formed in parent materials transported from upstream sources and deposited by the rivers and smaller streams in Young County.

Eolian sand and silt parent materials have their origins in fluvial sediments from stream channels and flood plains.

Topography

Young County is within the Osage Plain section of the Central Lowlands physiographic province (Schoeneberger and others, 1997). The Osage Plain is described as old scarped plains beveling slightly inclined geologic strata with entrenched main stream channels. Osage Plain upland topography is essentially degrading or eroding surfaces; flood plain topography is mostly aggrading or depositional surfaces.

Topography is the relative positions and elevations of natural or man-made features that define the surface configuration of an area (Hawley and Parsons, 1980). Natural features include plains, ridges, escarpments, hills, interfluvies, valleys, fluvial terraces, drainageways, and flood plains. Man-made topographic features in Young County are localized, which include cropland terraces, ponds and tanks, private and public roads, and roads and drilling pads for petroleum exploration and production.

Topography and its slope characteristics influence soil formation through effects on surface runoff, soil moisture penetration depths and drainage. If other factors remain constant, the degree of soil profile development depends on the amount and depth of soil moisture penetration. The more times a soil is subjected to a wetting and drying cycle, the greater and more distinct the soil development. As slope-gradient increases, especially in excess of 8 percent, water penetration depth significantly decreases. Soil formation is retarded because less water is available for soil moisture. Less water for soil moisture is because of enhanced surface runoff, which is an effect of greater slope gradient.

Upland runoff and fluvial differential erosion has resulted in slopes within Young County that range from nearly level to very steep. Some broad interfluvies are nearly level to gently sloping. Slopes on the sides of ridges, escarpments, and a few hills are steep. Slopes adjacent to drainageways are generally gently sloping. However, streams flowing over erosion resistant sandstone and limestone, and aided by colluvial processes, have incised steep slopes. Nearly level areas are on flood plains and fluvial terraces. Eolian landscapes, consisting of low stabilized dunes with sand and silt sheets, are located south of Newcastle in the central part of the county, and in the Padgett community vicinity near the northwestern county boundary.

Processes of Horizon Differentiation

Soil forms through complex processes that are grouped into four general categories. These are additions, removals, transfers, and transformations. These processes affect soil formation in differing degrees and account for the presence of soil layers or horizons.

The accumulation of organic matter in the A horizon of the soil in Young County is an example of an addition. This accumulation is the main reason for the dark color of the A horizon. The color of raw parent material is uniform with increasing depth.

The leaching of lime or bases from the upper few feet in many soils is an example of removal. The parent material of these soils contains more lime or bases than the soil itself. This indicates leaching of the soil profile by percolating water.

The movement of clay and other material from the A horizon to the B horizon is an example of transfer. The E horizon is a zone of maximum eluviation, or loss. The B horizon is a zone of illuviation, or gain. Thurber, Sagerton, and many other soils have maximum clay content in the Bt horizon. An indication of transfer of clay is thin clay films in pores and faces of peds.

Surface Geology

The Geologic Atlas of Texas, Abilene Sheet and Wichita Falls-Lawton Sheet, and the Geologic Map of Texas depict the geologic outcrops in Young County (Barnes, 1972; 1987; 1992). Bureau of Economic Geology, "Report of Investigations No. 82" and "Report of Investigations No. 170," discusses in detail the stratigraphy, lithology, depositional environments, and nomenclature of Pennsylvanian and Permian age strata in Young and surrounding counties (Erxleben, 1975; Hentz, 1988). "Report of Investigations No. 170," explains the mapping rationale and new terminology used on the Wichita Falls-Lawton and Abilene sheets of the Geologic Atlas of Texas.

Lithology and stratigraphic descriptions are extracted from the atlas sheets and "Report of Investigations No. 170," unless local field observations specific to Young County indicate otherwise. The following discussion on Young County Pennsylvanian and Permian age strata, however, is limited to lithologic and outcrop characteristics as related to soil parent materials and geomorphology.

Pennsylvanian age outcrops dominate the southeastern Young County area. Pennsylvanian-Permian age strata crop out in a northeast-southwest trending belt across the central sector of the county; and Permian age formations crop out in the northwestern

part of Young County. Quaternary age sediment is substrate to relict stream terraces and modern flood plains deposited during the Pleistocene and Holocene epochs, respectively.

Isolated Pleistocene eolian sediments, derived from fluvial deposition, are located northeast of Salt Fork Brazos River.

Quaternary stream channel locations and surface runoff have had a profound influence on geologic outcrops and geomorphic surfaces on which Young County soils have developed. Salt Fork Brazos River, Clear Fork Brazos River and their tributaries drain approximately the southwest three-fourths of the county. The Salt Fork Brazos River flows from the northwest, through the central sector, and confluences with Clear Fork Brazos River to form the Brazos River in the south-central part of the county. Brazos River flows into Possum Kingdom Lake in the southeastern corner of the county. Tributaries to West Fork Trinity River drain the northeastern sector of the county. The rivers and their tributaries have stripped away late Tertiary and early Quaternary age sediments and exposed the underlying Pennsylvanian and Permian age formations (Walker, 1978). Subsequent erosion and sediment deposition from water and wind have formed the current landscapes.

Pennsylvanian and Permian strata, and Quaternary fluvial and wind blown sediments are the major sources of soil parent materials in Young County. Shale and mudstone are overlain by clayey and loamy soils. Sandstone and conglomerate are overlain by fine to coarse sand soils, respectively. Fluvial sediment is the parent material for clayey to gravelly soils. Wind blown or eolian sediment is parent material for loamy-sand and sand soils. Consequently, the General Soils Map depicts the general location and areal extent of Pennsylvanian and Permian age outcrops, Quaternary eolian and fluvial deposition, and related stream patterns.

Pennsylvanian Formations and Associated Soils

The Placid Shale outcrop, the oldest in Young County, is in the extreme southeastern corner of the county (Barnes, 1972). Impoundment of Possum Kingdom Lake on the Brazos River has inundated almost all the limited Placid Shale outcrop in Young County. The remaining aerated outcrop area is covered with a mantle of colluvium from the overlying Ranger Limestone and sediment derived from upland erosion, or with pre-impoundment deposition from Brazos River floodwaters. Consequently, the Placid Shale is not considered a significant source of soil parent material in Young County.

The Ranger Limestone, Colony Creek Shale, and Home Creek Limestone Formations are significant sources of soil parent material in Young County. Their outcrops, however, are confined to the extreme southeastern sector of the county in the vicinity of Possum Kingdom Lake. Erosion resistant limestone, recessive shale, proximity to the Brazos River, and differential erosion has produced a landscape accentuated by ridges, escarpments, and hills separated by long, narrow valleys. Typically, the limestone formations support the higher elevation slope landforms, and the shale formations are substrate for the lower slope and depressional landforms.

Ranger Limestone

This formation is massive, unevenly bedded, 50 to 60 feet thick, erosion resistant, and forms a prominent escarpment and dip slope overlooking Possum Kingdom Lake. Soils typically mapped over the Ranger Limestone are the Palo Pinto, Lindy, Rowden, and Hensley series. Thurber soils are mapped in colluvium at the base of the dip slope.

Colony Creek Shale

This marine, shallow water, relatively erodible formation overlies the Ranger Limestone. It is 110 to 220 feet thick, contains sparse ferruginous nodules, and is locally calcareous and gypsiferous. The formation is locally interbedded with siltstone and laminated, ripple marked, thin to medium beds of fine-grained sandstone. A few

argillaceous limestone lentils are in the upper part of the formation. Set and Throck soils are mapped over the Colony Creek Shale.

Home Creek Limestone

This carbonate formation is relatively erosion resistant, and 2 to about 10 feet thick in Young County. Lindy, Rowden, and Hensley soils are mapped on the ridges and hill summits. Hensley and Palo Pinto soils have developed on the backslopes.

The Kisinger Sandstone, a member of the Home Creek Limestone Formation, is restricted to southeastern Young County. This sandstone is a very thick, up to 140 feet, local channel-fill deposit. In contrast to Home Creek Limestone marine carbonate strata, Kisinger Sandstone fluvial-deltaic clastic sediments were laid down in a channel abraded through Home Creek Limestone, the Colony Creek Shale, and conceivably into the top of the Ranger Limestone. These erosion and sedimentation processes were possible after the Pennsylvanian Sea retreated and exposed previously inundated marine sediments. The Kisinger Sandstone is fine to medium grained, conglomeratic, cross-bedded, and massive with angular limestone cobbles and boulders locally concentrated at its margins. Jacksboro, Exray, and Loving soils have formed in parent materials derived from these clastic strata.

The Kisinger Sandstone and other channel-fill deposits in Young County contribute to a complex stratigraphy interpretation quandary. Similar channel-fill deposits also diversify soil parent material sources throughout Young County. Commonly, these clastic fluvial deposits have transected adjacent outcrops, and contributed to the dilemma of mapping and classifying soils relative to geologic outcrop.

Graham and Thrifty Formations, undivided

Late Pennsylvanian sea transgressions and regressions produced repetitive sequences of mudstone, shale, and sandstone. These deltaic-fluvial sequences are separated by erosion resistant Gonzales Limestone, Bunger Limestone, Lower Gunsight Limestone, and Blach Ranch Limestone members. These carbonate members are generally discontinuous and 1 to 4 feet thick. The Gonzales Creek Sandstone member, mostly a channel-fill deposit, is relatively erosion resistant and crops out at the summits of ridges, escarpments and on their dip-slopes. The Avis Sandstone member, another major channel-fill deposit, crops out in a northeast-southwest trending band of irregularly shaped erosion remnants. Other unnamed clastic channel-fill deposits are mapped within the Graham and Thrifty Formations (Barnes, 1972; 1987). Thin, discontinuous seams of subbituminous coal also crop out. Coal seams, however, are not really significant and are unmapped. Thickness of the Graham and Thrifty Formations, undivided, is 150 to 500 feet.

The landscape over the Graham and Thrifty Formations (undivided) is comprised of landforms which are dominantly discontinuous ridges, escarpments, and low hills separated by valleys and drainageways. Principal geologic factors in the development of these landforms, and the landforms over other formations in Young County, are strike, dip, and lithologic characteristics of the geologic substrate. Consequently, erosion resistant limestone and more indurated, hard sandstone are at the summits and shoulder slopes of ridges, escarpments, and hills. Less indurated sandstone-conglomerate and erodible shale-mudstone are substrate to backslopes, footslopes, and toeslopes. Sediment from upland erosion and colluvium has accumulated on the lower footslopes and upper toeslopes. Colluvium, as should be expected, is more abundant below the steeper slopes.

Rowden, Lindy, Hensley, and Palo Pinto soils have developed over limestone on the summits; Newcastle, Jolly, Bonti, Bluegrove, and Jacksboro soils are mapped over erosion resistant sandstone. Palo Pinto and Hensley soils are delineated over limestone on shoulder slopes. Exray and Loving soils have developed in sandstone derived parent materials. Set, Throck, Owens, Truce, Harpersville, and Shatruce soils are on backslopes over shale and mudstone. Shale and mudstone on footslopes are the parent material

source for Callahan soils. Thurber, Weswind, and Anocon soils have developed in colluvium on toeslopes.

The Shatruce-Exray-Loving and Set-Palopinto-Lindy general soils map unit includes the Pennsylvanian Formations.

Pennsylvanian—Permian Formations and Associated Soils

The Harpersville Formation (revised) is upper Pennsylvanian in age and the Pueblo Formation (revised) is lower Permian age. On a multi-county scale, these formations possess horizontal variances in facies characteristics that indicate different depositional environments, a shallow marine environment to the southwest and a fluvial-deltaic continental environment to the northeast. These horizontal variances in facies characteristics coalesce in southwestern Young County, where the Harpersville Formation (revised) and Pueblo Formation (revised) merge with the Pennsylvanian-Permian age Markley Formation (new) (Barnes, 1972; 1987).

In addition to facies convergence, unnamed Pennsylvanian-Permian age channel-fill sandstone and conglomerate were deposited on the Harpersville Formation, Pueblo Formation and Markley Formation (new) (Barnes, 1972; 1987); effectively homogenizing soil parent materials in the outcrop area. Consequently, the Harpersville Formation (revised), Pueblo Formation (revised) and the channel-fill deposits are all considered as a part of the Markley Formation (new) in the following discussion.

Markley Formation (new)

Lithic composition of the Markley Formation (new) is mostly mudstone and shale with 15 delineated channel-fill sandstone and conglomerate units (Barnes, 1972; 1987). Mudstone and shale are locally gypsiferous and are interbedded with sparse argillaceous limestone lentils in southern Young County. Unmapped discontinuous seams of subbituminous coal and carbonaceous shale crop out from the central to the northeast sectors of the county. The Breckenridge Limestone member, 1 to 4 feet thick, consists of three limestone beds locally interstratified with thin shale. The Crystal Falls Limestone member occurs in discontinuous outcrops, 1 to 2 feet thick, in southern Young County. The limestone members and more erosion resistant channel-fill sandstone are substrate for low ridges and hills. Thickness of the Markley Formation (new) is about 300 to 440 feet.

The landscape and landforms over the Markley Formation (new) are similar to those over the Graham and Thrifty Formations (undivided). The principal differences: the summits are slightly lower and broader and the valleys and drainageways are comparatively wider.

Soils and their landscape and landform positions are essentially as those mapped over the Graham and Thrifty Formations (undivided).

The Bluegrove-Newcastle-Jolly general soils map unit includes Pennsylvanian-Permian formations.

Permian Formations and Associated Soils

From oldest to youngest, the Moran Formation, Santa Anna Branch Shale, Archer City Formation (new), and Admiral Formation (revised) crop out in Young County (Barnes, 1987; 1992). Moran Formation outcrops in Young County are restricted to three small areas along the western county boundary with Throckmorton County. The southern-most outcrop is west of the Murray community. The remaining outcrops are north of U.S. Highway 380 on the interfluvium between Elm Creek and Salt Fork Brazos River. The Santa Anna Branch Shale crops out over the Moran Formation between Elm Creek and Salt Fork Brazos River. The Admiral Formation (revised) outcrop is of limited extent in the extreme northwestern corner of the county (Barnes, 1987; 1992).

In the same fashion as the older Pennsylvanian-Permian strata, the Moran Formation and Santa Anna Branch Shale merge in northeastern Throckmorton County to form the

Archer City Formation (new). The Archer City Formation (new) outcrop belt, after merging with the Moran Formation and Santa Anna Branch Shale, strikes in a northeasterly direction and crosses the northwestern sector of Young County. There are four major mapped clastic channel-fill deposits and some lesser unmapped deposits on the Archer City Formation outcrop. Channel-fill deposits on the Archer City Formation are erosion remnants that are not as thick and really dominant as those on the older strata to the southeast.

The Moran Formation, mostly mudstone and sandstone, and Santa Anna Branch Shale are combined with the Archer City Formation because of a paucity in outcrop area, lithologic and geomorphic characteristics comparability, and similarity as soil parent material sources.

Archer City Formation (new)

Deltiac-fluvial mudstone, sandstone and conglomerate dominate the Archer City Formation (new) in Young County (Barnes, 1987; Hentz, 1988). The mudstone is thick bedded and massive in units, 5 to 100 feet thick, and typically exposed below relatively erosion resistant sandstone on the summits of low hills and ridges. Thin to massive, 1 to 3 feet thick, fine to medium grained sandstone is commonly interbedded with the mudstone. Rare outcrops of thin, discontinuous, limestone lentils are exposed on shoulder slopes hills and ridges. Nine channel-fill deposits are mapped in the Archer City Formation, four of which are delineated in Young County. Channel-fill deposits are fine to very coarse grained, friable to moderately well indurated, massive to thick bedded, sandstone and conglomerate. Archer City Formation (new) thickness is 350 to 400 feet.

Thicker mudstone strata and diminished outcrops of relatively erosion resistant sandstone and conglomerate in the Archer City Formation (new) contribute to a southeast to northwest trend in Young County of progressively lower hills and ridges, broader interfluvies, and wider valleys and drainageways. Newcastle, Jolly, and Bluegrove soils have developed over sandstone on the summits of hills and ridges. Palo Pinto and Hensley soils are delineated over limestone on shoulder slopes; Exray and Loving soils have developed in sandstone derived parent materials. Eroded shale and mudstone on backslopes and footslopes are the parent material sources for Vernon and Knoco soils; and Kaymay, Weswind, and Tillman soils have developed in colluvium on toeslopes.

The Tillman-Vernon general soils map unit includes Archer City Formation (new).

Admiral Formation (revised)

The Admiral Formation (revised) outcrop in Young County is limited to the extreme northwest corner of the county. It is mostly mudstone and shale with interbedded friable sandstone, similar to the Archer City Formation (new).

Landscape and landforms over the Admiral Formation (revised) in Young County are also similar to those over the Archer City Formation (new); and the soils mapped are essentially as those developed over the Archer City Formation (new).

The Tillman-Vernon general soils map unit includes the Admiral Formation (revised).

Quaternary Formations—Sediment and Associated Soils

Quaternary age sediment in Young County is mapped as Pleistocene fluvial terrace deposits and surficial deposits (undivided), Holocene windblown sand and silt sheet deposits and flood plain alluvium (Barnes, 1972; 1987; 1992). Locations of the fluvial sediments and associated soil parent materials are determined by stream channel locations. The eolian upland deposits were derived principally from stream channel and flood plain sand and silt.

The maximum eastern limits of the late Tertiary age Ogallala Formation extended into and probably beyond southern Young County (Walker, 1978). Erosion and removal of this overlying Miocene-Pliocene age formation and early Pleistocene strata exposed Pennsylvanian and Permian mudstone, shale, sandstone, and conglomerate.

Subsequent episodes of erosion and deposition have also provided sediment for Pleistocene and Holocene age fluvial deposition. Major components of Pleistocene terrace substrate are Permian and Tertiary clastic sediments. Clay, silt, and sand are the major constituents of Holocene flood plain deposits.

Fluvatile Terrace Deposits

Pleistocene age fluvatile terrace deposits are the remnants of ancient flood plains along Salt Fork Brazos River, Clear Fork Brazos River, Elm Creek, and Brazos River. Stream channel entrenchment and other erosion processes have left broad, relict terraces above and on the periphery of younger Holocene age flood plains. These deposits are mostly sand and silt. However, pebbles and cobbles of chert, quartzite, igneous, and metamorphic rock and caliche are common. A mantle of cross-bedded to massive, lenticular quartz sand is present at higher elevations. Grandfield, Winters, Devol, Heaton, Minwells, Chaney, and Enterprise soils have developed in these ancient sediments.

Fluvatile terrace soils are included in the Grandfield-Gowen general soils map unit.

Surficial Deposits (undivided)

These Pleistocene age sediments in Young County are two erosion remnants, one in the Olney community vicinity and the other is on the northwestern county boundary with Throckmorton County. These relict sediments are probably Seymour Formation outliers. Silt and clay with lessor amounts of sand and caliche are the substrate for nearly level to gently sloping landscapes. Sagerton, Abilene, and Rowden soils dominate these landscapes.

These soils are within the Sagerton general soils map unit.

Windblown Sand and Silt Sheet Deposits

Upland sandy and loamy sand soils have developed northeast of Salt Fork Brazos River in the northwest sector of the county. This area is characterized by eolian sand and silt derived mostly from the river channel and flood plain. Goodnight and Heaton soils have developed from these eolian deposits.

These soils are within the Grandfield-Gowen general soils map unit.

Alluvium

The youngest geologic unit in Young County is Holocene age alluvium deposited by floods from major streams. Flood plain sediments are mapped along the Salt Fork Brazos River, Clear Fork Brazos River, Brazos River and their tributaries, and tributaries to West Fork Trinity River (Barnes, 1972; 1987). These unconsolidated sediments are gravel, sand, clay, and silt parent materials for Gowen, Clearfork, Wheatwood, Westola, Lincoln, and Padgett soils.

Flood plain soils are in the Grandfield-Gowen, Lincoln-Westola-Padgett, and Clearfork-Wheatwood general soils map unit.

References

- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
- American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.
- Barnes, V.E., 1972. Geologic atlas of Texas, Abilene sheet, Bureau of Economic Geology, The University of Texas at Austin, Austin, Texas.
- _____, 1987. Geologic atlas of Texas, Wichita Falls-Lawton sheet, Bureau of Economic Geology, The University of Texas at Austin, Austin, Texas.
- _____, 1992. Geologic map of Texas, Bureau of Economic Geology, The University of Texas at Austin, Austin, Texas.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
- Erxleben, A.W., 1975. Depositional systems in Canyon Group (Pennsylvanian System), North-Central Texas: Bureau of Economic Geology, The University of Texas at Austin, Austin, Texas.
- Federal Register. July 13, 1994. Changes in hydric soils of the United States.
- Federal Register. February 24, 1995. Hydric soils of the United States.
- Hawley, J.W., R.B. Parsons, 1980. Glossary of selected geomorphic and geologic terms, Mimeo., USDA Soil Conservation Service, West National Technical Center, Portland, Oregon, 30p.
- Hentz, T.F., 1988. Lithostratigraphy and paleoenvironments of upper paleozoic continental red beds, North-Central Texas: Bowie (new) and Wichita (revised) Groups, Bureau of Economic Geology, The University of Texas at Austin, Austin, Texas.
- Hurt, G.W., P.M. Whited, and R.F. Pringle, editors. Version 5.0, 2002. Field indicators of hydric soils in the United States.
- National Research Council. 1995. Wetlands: Characteristics and boundaries.
- Schoeneberger, P.J., D.A. Wysocki, E.C. Benham and W.D. Broderson, 1997. Field book for describing and sampling soils, version 1.0. National Soil Survey Center, Natural Resources Conservation Service, USDA, Lincoln, NE.
- Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. <http://soils.usda.gov/technical/>
- Soil Survey Staff. 1998. Keys to soil taxonomy. 8th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.
- Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey of Young County, Texas

- Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
- United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. <http://soils.usda.gov/technical/>
- United States Department of Agriculture, Natural Resources Conservation Service. 1996. Soil survey laboratory methods manual. Soil Survey Investigations Report 42, Version 3.0. <http://soils.usda.gov/technical/>
- United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.
- United States Department of Agriculture, Soil Conservation Service. 1981. Land resource regions and major land resource areas of the United States. U.S. Department of Agriculture Handbook 296.
- Walker, J.R., 1978. Geomorphic evolution of the southern high plains, Bulletin No. 35, Baylor Geological Studies, The Baylor University Press, Waco, Texas.

Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate.....	6 to 9
High	9 to 12
Very high.....	more than 12

Back slope. The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Back slopes in profile are commonly steep, are linear, and may or may not include cliff segments.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

- Bottomland.** The normal flood plain of a stream, subject to flooding.
- Boulders.** Rock fragments larger than 2 feet (60 centimeters) in diameter.
- Brush management.** Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.
- Calcareous soil.** A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.
- Canopy.** The leafy crown of trees or shrubs. (See Crown.)
- Capillary water.** Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.
- Catena.** A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.
- Cation.** An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.
- Cation-exchange capacity.** The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.
- Chemical treatment.** Control of unwanted vegetation through the use of chemicals.
- Chiseling.** Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.
- Clay.** As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.
- Clay depletions.** Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.
- Clay film.** A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.
- Claypan.** A slowly permeable soil horizon that contains much more clay than the horizons above. A claypan is commonly hard when dry and plastic or stiff when wet.
- Climax plant community.** The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.
- Coarse textured soil.** Sand or loamy sand.
- Cobble (or cobblestone).** A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.
- Colluvium.** Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.
- Complex, soil.** A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.
- Compressible** (in tables). Excessive decrease in volume of soft soil under load.
- Concretions.** Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue of the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue of the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Delta. A body of alluvium having a surface that is nearly flat and fan shaped; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained*, *somewhat excessively drained*, *well drained*, *moderately well drained*, *somewhat*

poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Ecological site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity*, *normal moisture capacity*, or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Footslope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai. Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

- Gleyed soil.** Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.
- Grassed waterway.** A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.
- Gravel.** Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.
- Gravelly soil material.** Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.
- Green manure crop** (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.
- Ground water.** Water filling all the unblocked pores of the material below the water table.
- Gully.** A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.
- Hard bedrock.** Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.
- Hardpan.** A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.
- High-residue crops.** Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.
- Horizon, soil.** A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:
- A horizon.*—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.
- E horizon.*—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.
- B horizon.*—The mineral horizon below an A, O, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) red or browner colors than those in the A horizon; or (4) a combination of these.
- C horizon.*—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.
- Cr horizon.*—Soft, consolidated bedrock beneath the soil.
- Humus.** The well decomposed, more or less stable part of the organic matter in mineral soils.
- Hydrologic soil groups.** Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of

water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Low strength. The soil is not strong enough to support loads.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few*, *common*, and *many*; size—*fine*, *medium*, and *coarse*; and contrast—*faint*, *distinct*, and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low.....	1.0 to 2.0 percent
Moderate.....	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high.....	more than 8.0 percent

Organoargillans. Dark, organic stained clay films.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan*, *fragipan*, *claypan*, *plowpan*, and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Pleistocene. The epoch of the Quaternary Period of geologic time, following the Pliocene Epoch and preceding the Holocene (from about 2 million to 10 thousand years ago); also the corresponding (time-stratigraphic) "series" of earth materials.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid.....	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid.....	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline.....	7.4 to 7.8
Moderately alkaline.....	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline.....	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff.

Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike. All the soils of a given series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by induration of a clay, silty clay, or silty clay loam deposit and having the tendency to split into thin layers.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 1 percent
Very gently sloping	1 to 3 percent
Gently sloping	3 to 5 percent
Moderately sloping.....	5 to 8 percent
Strongly sloping	8 to 12 percent
Moderately steep	12 to 20 percent
Steep	20 to 45 percent
Very steep.....	45 percent and higher

Soil Survey of Young County, Texas

Classes for complex slopes are as follows:

Nearly level	0 to 3 percent
Gently undulating	1 to 5 percent
Undulating	1 to 8 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand*, *loamy sand*, *sandy loam*, *loam*, *silt loam*, *silt*, *sandy clay loam*, *clay loam*, *silty clay loam*, *sandy clay*, *silty clay*, and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The outermost inclined surface at the base of a hill; part of a footslope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur that severely hinder establishment of vegetation or severely restrict plant growth.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Underlying material. The part of the soil below the solum.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an oven-dry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Soil Survey of Young County, Texas

Table 1.--Temperature And Precipitation
(Recorded for the period 1971-2000 at Graham, Texas)

Month	Temperature (Degrees F)						Precipitation (Inches)			
				2 years in 10 will have		Average number of		2 years in 10 will have		Average number of days
				Maximum	Minimum	growing		less	more	
	Average daily maximum	Average daily minimum	Average	temperature higher than	temperature less than	degree days*	Average	than	than	w/0.1 or more
January	55.0	27.1	41.1	82	8	32	1.16	0.31	1.86	3
February	60.6	32.3	46.5	88	9	80	1.79	0.57	2.81	3
March	69.4	40.8	55.1	93	19	196	2.22	0.74	3.44	4
April	77.3	48.9	63.1	96	27	396	2.45	1.05	3.64	4
May	84.2	59.4	71.8	101	39	675	4.52	1.83	6.79	6
June	91.2	67.7	79.5	104	51	884	3.60	1.69	5.24	5
July	96.6	71.5	84.1	107	59	1,056	2.17	0.52	3.49	3
August	96.2	70.0	83.1	107	58	1,026	2.32	0.66	3.67	4
September	88.9	61.8	75.4	104	40	759	3.64	1.08	5.74	5
October	79.3	49.5	64.4	98	30	447	3.79	0.99	6.03	5
November	66.4	38.3	52.4	87	19	151	1.88	0.54	2.97	3
December	57.3	29.0	43.2	82	9	41	1.81	0.39	2.93	4
Yearly:										
Average	76.9	49.7	63.3	---	---	---	---	---	---	---
Extreme	112	-8	---	109	3	---	---	---	---	---
Total						5,743	31.35	25.81	36.63	47

*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area.
(Threshold: 50.0 degrees F)

Soil Survey of Young County, Texas

Table 2.--Freeze Dates In Spring And Fall
(Recorded for the period 1971-2000 at Graham, Texas)

Probability	Temperature		
	24°F or lower	28°F or lower	32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 21	April 10	April 19
2 years in 10 later than--	March 14	April 2	April 13
5 years in 10 later than--	March 1	March 17	April 3
First freezing temperature in fall:			
1 year in 10 earlier than--	November 3	October 31	October 20
2 years in 10 earlier than--	November 9	November 6	October 26
5 years in 10 earlier than--	November 22	November 17	November 6

Table 3.--Growing Season
(Recorded for the period 1971-2000 at Graham, Texas)

Probability	Daily Minimum Temperature		
	Number of days higher than 24°F	Number of days higher than 28°F	Number of days higher than 32°F
	<u>Days</u>	<u>Days</u>	<u>Days</u>
9 years in 10	236	215	191
8 years in 10	246	224	199
5 years in 10	265	242	216
2 years in 10	283	260	232
1 year in 10	293	269	241

Soil Survey of Young County, Texas

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
AbA	Abilene loam, 0 to 1 percent slopes-----	2,712	0.5
AnB	Anocon fine sandy loam, 1 to 3 percent slopes-----	19,493	3.3
BgB	Bluegrove fine sandy loam, 1 to 3 percent slopes-----	69,517	11.7
BoB	Bonti fine sandy loam, 1 to 3 percent slopes-----	3,570	0.6
BpC	Bastrop loamy fine sand, 1 to 5 percent slopes-----	2,798	0.5
BsB	Bastrop fine sandy loam, 1 to 3 percent slopes-----	3,136	0.5
BsC2	Bastrop fine sandy loam, 1 to 5 percent slopes, moderately eroded-----	706	0.1
CaC2	Callahan loam, 2 to 5 percent slopes, moderately eroded-----	14,682	2.5
ChB	Chaney loamy fine sand, 0 to 3 percent slopes-----	1,479	0.2
CkA	Clearfork silty clay loam, 0 to 1 percent slopes, occasionally flooded---	5,226	0.9
DAM	Dams-----	10	*
DeB	Decordova loamy fine sand, 0 to 3 percent slopes-----	2,850	0.5
DnB	Deandale loam, 0 to 2 percent slopes-----	4,191	0.7
EnB	Enterprise very fine sandy loam, 1 to 3 percent slopes-----	3,644	0.6
EnC	Enterprise very fine sandy loam, 3 to 5 percent slopes-----	3,321	0.6
ExD	Exray-Loving complex, 1 to 8 percent slopes, extremely stony-----	51,967	8.7
GaB	Gageby loam, 0 to 2 percent slopes, occasionally flooded-----	1,614	0.3
GdF	Goodnight loamy fine sand, 3 to 20 percent slopes-----	270	*
GeA	Gowen loam, 0 to 1 percent slopes, occasionally flooded-----	35,119	5.9
GfB	Grandfield loamy fine sand, 0 to 3 percent slopes-----	4,957	0.8
GnB	Grandfield fine sandy loam, 1 to 3 percent slopes-----	10,861	1.8
GnC	Grandfield fine sandy loam, 3 to 5 percent slopes-----	2,584	0.4
GrB	Grandmore fine sandy loam, 0 to 2 percent slopes-----	1,174	0.2
HeC	Heaton fine sand, 1 to 5 percent slopes-----	1,713	0.3
HnB	Hensley loam, 1 to 3 percent slopes-----	659	0.1
HsB	Hensley stony loam, 1 to 3 percent slopes, extremely stony-----	2,290	0.4
JaB	Jacksboro fine sandy loam, 1 to 3 percent slopes-----	244	*
JrE	Jolly-Rock outcrop complex, 2 to 12 percent slopes, stony-----	6,951	1.2
KaA	Kamay silt loam, 1 to 3 percent slopes-----	9,420	1.6
KvE	Knoco-Vernon complex, 3 to 12 percent slopes-----	8,031	1.3
KvG	Knoco-Vernon complex, 3 to 45 percent slopes, extremely bouldery-----	466	*
LeB	Leeray clay, 1 to 3 percent slopes-----	6,501	1.1
LnA	Lincoln sandy loam, 0 to 1 percent slopes, occasionally flooded-----	8,904	1.5
LyB	Lindy silt loam, 1 to 3 percent slopes-----	6,668	1.1
MwB	Minwells fine sandy loam, 1 to 3 percent slopes-----	4,116	0.7
NcB	Newcastle loamy fine sand, 1 to 3 percent slopes-----	3,928	0.7
NeB	Newcastle fine sandy loam, 1 to 3 percent slopes-----	3,681	0.6
NoC	Newcastle-Jolly complex, 1 to 5 percent slopes-----	42,484	7.1
NuA	Nukrum clay loam, 0 to 1 percent slopes-----	1,846	0.3
OhG	Owens-Harpersville complex, 8 to 45 percent slopes, extremely bouldery---	12,096	2.0
OnE	Owens clay, 5 to 12 percent slopes, rubbly-----	7,907	1.3
Ow	Oil-waste land-----	822	0.1
PaA	Padgett clay, 0 to 1 percent slopes, occasionally flooded-----	3,443	0.6
PaD	Palopinto stony loam, 1 to 8 percent slopes, rubbly-----	2,924	0.5
QU	Pits, quarry-----	75	*
RwB	Rowden clay loam, 0 to 2 percent slopes-----	3,545	0.6
SaA	Sagerton loam, 0 to 1 percent slopes-----	6,281	1.1
SaB	Sagerton loam, 1 to 3 percent slopes-----	22,398	3.8
ScB	Springcreek loam, 1 to 3 percent slopes-----	1,457	0.2
SeB	Set clay loam, 1 to 3 percent slopes-----	2,381	0.4
SpG	Set-Palopinto complex, 8 to 40 percent slopes, extremely stony-----	6,625	1.1
StF	Shatruce gravelly fine sandy loam, 8 to 30 percent slopes, rubbly-----	43,624	7.3
StG	Shatruce gravelly fine sandy loam, 12 to 50 percent slopes, very rubbly--	13,840	2.3
ThB	Thurber clay loam, 1 to 3 percent slopes-----	22,539	3.8
TkC	Throck silty clay loam, 1 to 5 percent slopes-----	6,008	1.0
TmB	Tillman clay loam, 1 to 3 percent slopes-----	16,275	2.7
TrB	Truce fine sandy loam, 1 to 3 percent slopes-----	17,550	2.9
TrC	Truce fine sandy loam, 3 to 5 percent slopes-----	2,325	0.4
VeC	Vernon clay, 1 to 5 percent slopes-----	12,545	2.1
W	Water-----	7,681	1.3

Soil Survey of Young County, Texas

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
WaA	Westola fine sandy loam, 0 to 1 percent slopes, occasionally flooded-----	4,939	0.8
WdB	Weswind fine sandy loam, 1 to 3 percent slopes-----	10,600	1.8
WeA	Wheatwood loam, 0 to 1 percent slopes, occasionally flooded-----	5,828	1.0
WhB	Wichita clay loam, 1 to 3 percent slopes-----	687	0.1
WtB	Winters loam, 1 to 3 percent slopes-----	7,285	1.2
	Total-----	595,463	100.0

* Less than 0.1 percent.

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Table 5.--Prime and Other Important Farmland

(Only the soils considered prime or important farmland are listed. Urban or built-up areas of the soils listed are not considered prime or important farmland. If a soil is prime or important farmland only under certain conditions, the conditions are specified in parentheses after the soil name.)

Map Symbol	Map unit name	Farmland Classification
AbA	Abilene loam, 0 to 1 percent slopes	All areas are prime farmland
AnB	Anocon fine sandy loam, 1 to 3 percent slopes	All areas are prime farmland
BsB	Bastrop fine sandy loam, 1 to 3 percent slopes	All areas are prime farmland
CkA	Clearfork silty clay loam, 0 to 1 percent slopes, occasionally flooded	All areas are prime farmland
DnB	Deandale loam, 0 to 2 percent slopes	All areas are prime farmland
EnB	Enterprise very fine sandy loam, 1 to 3 percent slopes	All areas are prime farmland
EnC	Enterprise very fine sandy loam, 3 to 5 percent slopes	All areas are prime farmland
GaB	Gageby loam, 0 to 2 percent slopes, occasionally flooded	All areas are prime farmland
GeA	Gowen loam, 0 to 1 percent slopes, occasionally flooded	All areas are prime farmland
LeB	Leeray clay, 1 to 3 percent slopes	All areas are prime farmland
NcB	Newcastle loamy fine sand, 1 to 3 percent slopes	All areas are prime farmland
NuA	Nukrum clay loam, 0 to 1 percent slopes	All areas are prime farmland
PaA	Padgett clay, 0 to 1 percent slopes, occasionally flooded	All areas are prime farmland
SaA	Sagerton loam, 0 to 1 percent slopes	All areas are prime farmland
SaB	Sagerton loam, 1 to 3 percent slopes	All areas are prime farmland
SeB	Set clay loam, 1 to 3 percent slopes	All areas are prime farmland
TmB	Tillman clay loam, 1 to 3 percent slopes	All areas are prime farmland
WeA	Wheatwood loam, 0 to 1 percent slopes, occasionally flooded	All areas are prime farmland
WhB	Wichita clay loam, 1 to 3 percent slopes	All areas are prime farmland
WtB	Winters loam, 1 to 3 percent slopes	All areas are prime farmland
BoB	Bonti fine sandy loam, 1 to 3 percent slopes	Prime farmland if irrigated
BpC	Bastrop loamy fine sand, 1 to 5 percent slopes	Prime farmland if irrigated
ChB	Chaney loamy fine sand, 0 to 3 percent slopes	Prime farmland if irrigated
DeB	Decordova loamy fine sand, 0 to 3 percent slopes	Prime farmland if irrigated
GfB	Grandfield loamy fine sand, 0 to 3 percent slopes	Prime farmland if irrigated
GnB	Grandfield fine sandy loam, 1 to 3 percent slopes	Prime farmland if irrigated
GnC	Grandfield fine sandy loam, 3 to 5 percent slopes	Prime farmland if irrigated
GrB	Grandmore fine sandy loam, 0 to 2 percent slopes	Prime farmland if irrigated
KaA	Kamay silt loam, 1 to 3 percent slopes	Prime farmland if irrigated
LyB	Lindy silt loam, 1 to 3 percent slopes	Prime farmland if irrigated
MwB	Minwells fine sandy loam, 1 to 3 percent slopes	Prime farmland if irrigated
RwB	Rowden clay loam, 0 to 2 percent slopes	Prime farmland if irrigated
WaA	Westola fine sandy loam, 0 to 1 percent slopes, Occasionally flooded	Prime farmland if irrigated
WdB	Weswind fine sandy loam, 1 to 3 percent slopes	Prime farmland if irrigated

Soil Survey of Young County, Texas

Table 6.--Irrigated and Nonirrigated Yields by Map Unit

(Yields in the "N" columns are for nonirrigated areas; those in the "I" columns are for irrigated areas. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Map symbol and soil name	Land capability		Cotton lint		Grain sorghum		Wheat	
	N	I	N	I	N	I	N	I
			Lbs	Lbs	Bu	Bu	Bu	Bu
AbA: Abilene-----	2c	1	375.00	775.00	35.00	115.00	30.00	60.00
AnB: Anocon-----	2e	---	---	---	45.00	---	20.00	---
BgB: Bluegrove-----	3e	---	250.00	---	30.00	---	25.00	---
BoB: Bonti-----	3e	---	---	---	40.00	---	---	---
BpC: Bastrop-----	3e	---	350.00	---	55.00	---	---	---
BsB: Bastrop-----	2e	---	350.00	---	55.00	---	---	---
BsC2: Bastrop, eroded-----	3e	---	250.00	---	40.00	---	---	---
CaC2: Callahan-----	4e	---	---	---	25.00	---	---	---
ChB: Chaney-----	3e	---	---	---	35.00	---	---	---
CkA: Clearfork-----	2w	---	375.00	---	35.00	---	30.00	---
DAM: Dams-----	---	---	---	---	---	---	---	---
DeB: Decordova-----	3e	---	250.00	---	30.00	---	20.00	---
DnB: Deandale-----	3e	3e	275.00	650.00	35.00	60.00	25.00	45.00
EnB: Enterprise-----	2e	2e	350.00	650.00	35.00	90.00	25.00	50.00
EnC: Enterprise-----	3e	3e	250.00	550.00	30.00	75.00	20.00	45.00
ExD: Exray-----	6s	---	---	---	---	---	---	---
Loving-----	7s	---						
GaB: Gageby-----	2w	2w	300.00	900.00	30.00	110.00	20.00	60.00

Soil Survey of Young County, Texas

Table 6.--Irrigated and Nonirrigated Yields by Map Unit--Continued

Map symbol and soil name	Land capability		Cotton lint		Grain sorghum		Wheat	
	N	I	N	I	N	I	N	I
			Lbs	Lbs	Bu	Bu	Bu	Bu
GdF: Goodnight-----	6e	---	---	---	---	---	---	---
GeA: Gowen-----	2w	---	500.00	---	70.00	---	30.00	---
GfB: Grandfield-----	3e	---	250.00	---	30.00	---	20.00	---
GnB: Grandfield-----	2e	---	300.00	---	30.00	---	20.00	---
GnC: Grandfield-----	3e	---	250.00	---	30.00	---	20.00	---
GrB: Grandmore-----	2e	---	325.00	---	35.00	---	20.00	---
HeC: Heaton-----	3e	---	---	---	40.00	---	---	---
HnB: Hensley-----	4s	---	---	---	25.00	---	20.00	---
HsB: Hensley-----	6s	---	---	---	---	---	---	---
JaB: Jacksboro-----	6s	---	---	---	---	---	---	---
JrE: Jolly-----	4e	---	---	---	---	---	15.00	---
Rock outcrop-----	8s	---	---	---	---	---	---	---
KaA: Kamay-----	3e	3e	225.00	700.00	25.00	65.00	20.00	45.00
KvE: Knoco-----	7s	---	---	---	---	---	---	---
Vernon-----	7s	---	---	---	---	---	---	---
KvG: Knoco-----	7s	---	---	---	---	---	---	---
Vernon-----	7s	---	---	---	---	---	---	---
LeB: Leeray-----	2e	---	250.00	---	45.00	---	25.00	---
LnA: Lincoln-----	3s	3s	---	---	25.00	50.00	20.00	40.00
LyB: Lindy-----	3e	---	250.00	---	35.00	---	25.00	---
MwB: Minwells-----	2e	---	---	---	45.00	---	---	---

Soil Survey of Young County, Texas

Table 6.--Irrigated and Nonirrigated Yields by Map Unit--Continued

Map symbol and soil name	Land capability		Cotton lint		Grain sorghum		Wheat	
	N	I	N	I	N	I	N	I
			Lbs	Lbs	Bu	Bu	Bu	Bu
NcB: Newcastle-----	4e	---	200.00	500.00	25.00	70.00	18.00	40.00
NeB: Newcastle-----	3e	2e	200.00	500.00	25.00	70.00	18.00	40.00
NoC: Newcastle-----	3e	3e	150.00	---	25.00	60.00	15.00	35.00
Jolly-----	4e	---						
NuA: Nukrum-----	2s	---	---	---	50.00	---	---	---
OhG: Owens-----	7s	---	---	---	---	---	---	---
Harpersville-----	7s	---						
OnE: Owens-----	7s	---	---	---	---	---	---	---
Ow: Oil-waste land-----	8s	---	---	---	---	---	---	---
PaA: Padgett-----	3w	3w	200.00	650.00	25.00	70.00	15.00	40.00
PaD: Palopinto-----	6s	---	---	---	---	---	---	---
QU: Pits, quarry-----	---	---	---	---	---	---	---	---
RwB: Rowden-----	3e	---	250.00	---	40.00	---	20.00	---
SaA: Sagerton-----	2c	1	375.00	750.00	55.00	115.00	30.00	60.00
SaB: Sagerton-----	2e	2e	350.00	700.00	40.00	100.00	25.00	50.00
ScB: Springcreek-----	4s	---	---	---	---	---	15.00	---
SeB: Set-----	2e	---	---	---	---	---	---	---
SpG: Set-----	7s	---	---	---	---	---	---	---
Palopinto-----	7s	---						
StF: Shatruce-----	7s	---	---	---	---	---	---	---
StG: Shatruce-----	7s	---	---	---	---	---	---	---

Soil Survey of Young County, Texas

Table 6.--Irrigated and Nonirrigated Yields by Map Unit--Continued

Map symbol and soil name	Land capability		Cotton lint		Grain sorghum		Wheat	
	N	I	N	I	N	I	N	I
			Lbs	Lbs	Bu	Bu	Bu	Bu
ThB: Thurber-----	3e	---	---	---	30.00	---	20.00	---
TkC: Throck-----	4e	---	150.00	---	25.00	---	15.00	---
TmB: Tillman-----	3e	2e	275.00	700.00	28.00	65.00	25.00	45.00
TrB: Truce-----	3e	---	---	---	35.00	---	---	---
TrC: Truce-----	4e	---	---	---	30.00	---	---	---
VeC: Vernon-----	4e	4e	---	---	25.00	---	16.00	25.00
W: Water-----	---	---	---	---	---	---	---	---
WaA: Westola-----	2w	---	425.00	---	50.00	---	30.00	---
WdB: Weswind-----	2e	---	250.00	---	---	---	25.00	---
WeA: Wheatwood-----	2w	---	350.00	---	35.00	---	30.00	---
WhB: Wichita-----	2e	2e	275.00	700.00	26.00	100.00	25.00	50.00
WtB: Winters-----	2e	---	300.00	---	50.00	---	25.00	---

Soil Survey of Young County, Texas

Table 7.--Rangeland Productivity

(Only the soils that support rangeland vegetation suitable for grazing are rated.)

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
AbA: Abilene-----	Clay Loam 23-30" PZ	2,500	2,000	1,300
AnB: Anocon-----	Loamy Prairie 26-33" PZ	7,000	5,000	3,500
BgB: Bluegrove-----	Tight Sandy Loam 26-33" PZ	4,000	3,200	2,000
BoB: Bonti-----	Sandy Loam 26-33" PZ	6,000	3,500	3,000
BpC: Bastrop-----	Loamy Sand 26-33" PZ	5,500	4,500	3,000
BsB: Bastrop-----	Sandy Loam 26-33" PZ	5,500	4,500	3,000
BsC2: Bastrop, eroded-----	Sandy Loam 26-33" PZ	5,500	4,500	3,000
CaC2: Callahan-----	Claypan Prairie 26-33" PZ	4,000	3,500	3,000
ChB: Chaney-----	Loamy Sand 26-33" PZ	4,500	4,000	3,000
CkA: Clearfork-----	Loamy Bottomland 26-33" PZ	6,000	3,500	2,500
DAM: Dams-----	---	---	---	---
DeB: Decordova-----	Loamy Sand 29-33" PZ	5,000	4,000	2,000
DnB: Deandale-----	Claypan Prairie 24-29" PZ	2,800	2,200	1,600
EnB: Enterprise-----	Sandy Loam Prairie 23-31" PZ	3,000	2,400	1,700
EnC: Enterprise-----	Sandy Loam Prairie 23-31" PZ	3,000	2,400	1,700
ExD: Exray-----	Sandstone Hill 26-33" PZ	6,000	4,000	2,500
Loving-----	Sandstone Hill 26-33" PZ	3,200	2,100	1,400
GaB: Gageby-----	Draw 23-30" PZ	3,000	2,400	1,800
GdF: Goodnight-----	Sand Hills 26-33" PZ	4,000	3,000	2,000
GeA: Gowen-----	Loamy Bottomland 26-33" PZ	8,000	5,500	4,000

Soil Survey of Young County, Texas

Table 7.--Rangeland Productivity--Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
GfB: Grandfield-----	Loamy Sand Prairie 23-31" PZ	3,700	2,600	1,900
GnB: Grandfield-----	Sandy Loam Prairie 23-31" PZ	4,000	2,800	2,000
GnC: Grandfield-----	Sandy Loam Prairie 23-31" PZ	4,000	2,800	2,000
GrB: Grandmore-----	Sandy Loam Prairie 23-31" PZ	4,300	2,900	2,100
HeC: Heaton-----	Sandy 29-33" PZ	4,500	3,500	2,000
HnB: Hensley-----	Redland 26-33" PZ	4,500	3,500	2,500
HsB: Hensley-----	Redland 26-33" PZ	4,500	3,500	2,500
JaB: Jacksboro-----	Sandstone Hill 26-33" PZ	5,000	3,000	1,500
JrE: Jolly----- Rock outcrop-----	Sandstone Hill 26-33" PZ ---	4,000 ---	3,000 ---	2,000 ---
KaA: Kamay-----	Claypan Prairie 24-29" PZ	2,700	2,100	1,500
KvE: Knoco----- Vernon-----	Very Shallow Clay 23-31" PZ Shallow Clay 23-30" PZ	2,400 2,400	1,800 1,800	1,200 1,200
KvG: Knoco----- Vernon-----	Very Shallow Clay 23-31" PZ Shallow Clay 23-30" PZ	2,400 2,400	1,800 1,800	1,200 1,200
LeB: Leeray-----	Clayey Upland 26-33" PZ	4,500	3,500	2,500
LnA: Lincoln-----	Sandy Bottomland 24-29" PZ	3,000	2,300	1,800
LyB: Lindy-----	Deep Redland 26-33" PZ	6,000	5,000	4,000
MwB: Minwells-----	Sandy Loam 26-33" PZ	4,000	3,000	2,000
NcB: Newcastle-----	Loamy Sand 26-33" PZ	6,000	4,500	3,000
NeB: Newcastle-----	Sandy Loam 26-33" PZ	6,000	4,500	3,000
NoC: Newcastle----- Jolly-----	Sandy Loam 26-33" PZ Sandstone Hill 26-33" PZ	6,000 4,000	4,500 3,000	3,000 2,000

Soil Survey of Young County, Texas

Table 7.--Rangeland Productivity--Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
NuA: Nukrum-----	Clay Loam 25-28" PZ	4,500	3,500	2,500
OhG: Owens-----	Rocky Hill 26-33" PZ	1,700	1,200	900
Harpersville-----	Rocky Hill 26-33" PZ	1,600	1,200	800
OnE: Owens-----	Rocky Hill 26-33" PZ	1,700	1,200	900
Ow: Oil-waste land-----	---	---	---	---
PaA: Padgett-----	Clayey Bottomland 26-33" PZ	3,000	2,250	1,500
PaD: Palopinto-----	Low Stony Hill 26-33" PZ	3,500	2,500	1,000
QU: Pits, quarry-----	---	---	---	---
RwB: Rowden-----	Clay Loam 26-33" PZ	4,500	3,500	2,500
SaA: Sagerton-----	Clay Loam 23-30" PZ	3,000	2,000	1,400
SaB: Sagerton-----	Clay Loam 23-30" PZ	3,000	2,000	1,400
ScB: Springcreek-----	Clay Loam 25-28" PZ	2,500	2,000	1,000
SeB: Set-----	Clay Slopes 26-33" PZ	4,500	3,500	2,500
SpG: Set-----	Steep Rocky 26-33" PZ	4,000	3,000	2,000
Palopinto-----	Steep Rocky 26-33" PZ	3,000	2,500	1,000
StF: Shatruce-----	Sandstone Hill 26-33" PZ	5,000	3,000	1,500
StG: Shatruce-----	Sandstone Hill 26-33" PZ	5,000	3,000	1,500
ThB: Thurber-----	Claypan Prairie 26-33" PZ	3,500	3,000	2,000
TkC: Throck-----	Clay Slopes 26-33" PZ	3,000	2,000	1,200
TmB: Tillman-----	Clay Loam 23-30" PZ	2,400	1,700	1,400
TrB: Truce-----	Tight Sandy Loam 26-33" PZ	4,000	3,000	2,000

Soil Survey of Young County, Texas

Table 7.--Rangeland Productivity--Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
TrC: Truce-----	Tight Sandy Loam 26-33" PZ	4,000	3,000	2,000
VeC: Vernon-----	Shallow Clay 23-30" PZ	2,500	1,700	1,000
W: Water-----	---	---	---	---
WaA: Westola-----	Loamy Bottomland 23-31" PZ	7,000	4,900	3,500
WdB: Weswind-----	Tight Sandy Loam 26-33" PZ	3,500	2,700	2,000
WeA: Wheatwood-----	Loamy Bottomland 26-33" PZ	8,000	6,500	5,000
WhB: Wichita-----	Clay Loam 23-30" PZ	3,000	2,500	1,500
WtB: Winters-----	Sandy Loam 26-33" PZ	2,500	2,200	1,200

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Table 8.--Agricultural Disposal of Manure, Food-Processing Waste, and Sewage Sludge

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AbA: Abilene-----	85	Somewhat limited Slow water movement	0.50	Somewhat limited Slow water movement	0.37
AnB: Anocon-----	90	Somewhat limited Slow water movement	0.50	Somewhat limited Slow water movement	0.37
BgB: Bluegrove-----	90	Somewhat limited Slow water movement	0.30	Somewhat limited Slow water movement	0.22
		Depth to bedrock	0.16	Depth to bedrock	0.16
		Droughty	0.01	Droughty	0.01
BoB: Bonti-----	85	Somewhat limited Droughty	0.86	Somewhat limited Droughty	0.86
		Depth to bedrock	0.80	Depth to bedrock	0.80
		Slow water movement	0.50	Slow water movement	0.37
BpC: Bastrop-----	90	Not limited		Not limited	
BsB: Bastrop-----	85	Not limited		Not limited	
BsC2: Bastrop, eroded-----	85	Not limited		Not limited	
CaC2: Callahan-----	90	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00
		Runoff	0.40	Depth to bedrock	0.16
		Depth to bedrock	0.16	Shallow to densic materials	0.15
		Shallow to densic materials	0.15		
ChB: Chaney-----	85	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00
		Dense layer	1.00		

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Table 8.--Agricultural Disposal of Manure, Food-Processing Waste, and Sewage Sludge --Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge	
		Rating class and limiting features	Value	Rating class and limiting features	Value
CkA: Clearfork-----	90	Somewhat limited Flooding Slow water movement	0.60 0.50	Very limited Flooding Slow water movement	1.00 0.37
DAM: Dams-----	100	Not rated		Not rated	
DeB: Decordova-----	90	Somewhat limited Leaching	0.45	Not limited	
DnB: Deandale-----	90	Very limited Slow water movement Sodium content Runoff	1.00 0.68 0.40	Very limited Slow water movement Sodium content	1.00 0.68
EnB: Enterprise-----	85	Somewhat limited Leaching	0.45	Not limited	
EnC: Enterprise-----	85	Somewhat limited Leaching	0.45	Not limited	
ExD: Exray-----	43	Very limited Droughty Large stones Depth to bedrock Slow water movement Large stones on the surface	1.00 1.00 1.00 0.50 0.50	Very limited Droughty Depth to bedrock Large stones on the surface Slow water movement	1.00 1.00 0.50 0.37
Loving-----	33	Very limited Droughty Large stones Depth to bedrock Large stones on the surface Runoff	1.00 1.00 1.00 1.00 0.40	Very limited Droughty Depth to bedrock Large stones on the surface	1.00 1.00 1.00
GaB: Gageby-----	90	Somewhat limited Flooding	0.60	Very limited Flooding	1.00

Soil Survey of Young County, Texas

Table 8.--Agricultural Disposal of Manure, Food-Processing Waste, and Sewage Sludge --Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge	
		Rating class and limiting features	Value	Rating class and limiting features	Value
GdF: Goodnight-----	90	Somewhat limited Filtering capacity Leaching Slope Droughty	0.99 0.45 0.16 0.01	Somewhat limited Filtering capacity Slope Droughty	0.99 0.16 0.01
GeA: Gowen-----	90	Somewhat limited Flooding	0.60	Very limited Flooding	1.00
GfB: Grandfield-----	90	Not limited		Not limited	
GnB: Grandfield-----	90	Not limited		Not limited	
GnC: Grandfield-----	90	Not limited		Not limited	
GrB: Grandmore-----	85	Somewhat limited Slow water movement	0.50	Somewhat limited Slow water movement	0.37
HeC: Heaton-----	85	Not limited		Not limited	
HnB: Hensley-----	85	Very limited Slow water movement Droughty Depth to bedrock Runoff	1.00 1.00 1.00 0.40	Very limited Droughty Depth to bedrock Slow water movement	1.00 1.00 1.00
HsB: Hensley-----	85	Very limited Slow water movement Droughty Large stones Depth to bedrock Cobble content	1.00 1.00 1.00 1.00	Very limited Droughty Depth to bedrock Slow water movement Cobble content Large stones on the surface	1.00 1.00 1.00 0.18
JaB: Jacksboro-----	90	Very limited Droughty Depth to bedrock Slow water movement Runoff	1.00 1.00 0.50 0.40	Very limited Droughty Depth to bedrock Slow water movement	1.00 1.00 0.37

Soil Survey of Young County, Texas

Table 8.--Agricultural Disposal of Manure, Food-Processing Waste, and Sewage Sludge --Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge	
		Rating class and limiting features	Value	Rating class and limiting features	Value
JrE: Jolly-----	68	Very limited Droughty Depth to bedrock Runoff	1.00 1.00 0.40	Very limited Droughty Depth to bedrock	1.00 1.00
Rock outcrop-----	17	Not rated		Not rated	
KaA: Kamay-----	85	Very limited Slow water movement Sodium content Runoff Salinity	1.00 1.00 0.40 0.06	Very limited Slow water movement Sodium content	1.00 1.00
KvE: Knoco-----	54	Very limited Slow water movement Dense layer Shallow to densic materials Depth to bedrock Droughty	1.00 1.00 1.00 1.00 1.00	Very limited Slow water movement Shallow to densic materials Depth to bedrock Droughty	1.00 1.00 1.00 1.00
Vernon-----	41	Very limited Slow water movement Large stones Depth to bedrock Shallow to densic materials Sodium content	1.00 1.00 0.84 0.84 0.68	Very limited Slow water movement Depth to bedrock Shallow to densic materials Sodium content	1.00 0.84 0.84 0.68
KvG: Knoco-----	35	Very limited Slow water movement Dense layer Shallow to densic materials Large stones Depth to bedrock	1.00 1.00 1.00 1.00 1.00	Very limited Slow water movement Shallow to densic materials Depth to bedrock Droughty Too steep	1.00 1.00 1.00 1.00 1.00
Vernon-----	30	Very limited Slow water movement Large stones Depth to bedrock Shallow to densic materials Sodium content	1.00 1.00 0.99 0.99 0.68	Very limited Slow water movement Depth to bedrock Shallow to densic materials Sodium content Slope	1.00 0.99 0.99 0.68 0.01

Soil Survey of Young County, Texas

Table 8.--Agricultural Disposal of Manure, Food-Processing Waste, and Sewage Sludge --Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge	
		Rating class and limiting features	Value	Rating class and limiting features	Value
LeB: Leeray-----	85	Very limited Slow water movement Runoff	1.00 0.40	Very limited Slow water movement	1.00
LnA: Lincoln-----	90	Somewhat limited Filtering capacity Flooding Droughty Leaching	0.99 0.60 0.47 0.45	Very limited Flooding Filtering capacity Droughty	1.00 0.99 0.47
LyB: Lindy-----	85	Very limited Slow water movement Runoff Depth to bedrock Droughty	1.00 0.40 0.29 0.25	Very limited Slow water movement Depth to bedrock Droughty	1.00 0.29 0.25
MwB: Minwells-----	85	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00
NcB: Newcastle-----	85	Very limited Slow water movement Filtering capacity Droughty Too acid Depth to bedrock	1.00 0.99 0.69 0.11 0.03	Very limited Slow water movement Filtering capacity Droughty Too acid Depth to bedrock	1.00 0.99 0.69 0.42 0.03
NeB: Newcastle-----	88	Very limited Slow water movement Droughty Depth to bedrock Shallow to densic materials	1.00 0.95 0.65 0.64	Very limited Slow water movement Droughty Depth to bedrock Shallow to densic materials	1.00 0.95 0.65 0.64
NoC: Newcastle-----	45	Very limited Slow water movement Droughty Depth to bedrock Shallow to densic materials	1.00 0.43 0.20 0.20	Very limited Slow water movement Droughty Depth to bedrock Shallow to densic materials	1.00 0.43 0.20 0.20

Soil Survey of Young County, Texas

Table 8.--Agricultural Disposal of Manure, Food-Processing Waste, and Sewage Sludge --Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Jolly-----	40	Very limited Droughty Depth to bedrock Runoff	1.00 1.00 1.00 0.40	Very limited Droughty Depth to bedrock	1.00 1.00 1.00
NuA: Nukrum-----	85	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00
OhG: Owens-----	59	Very limited Slow water movement Shallow to densic materials Large stones Depth to bedrock Too steep	1.00 1.00 1.00 1.00 1.00 1.00 1.00	Very limited Slow water movement Shallow to densic materials Depth to bedrock Too steep Droughty	1.00 1.00 1.00 1.00 1.00 0.88
Harpersville-----	36	Very limited Slow water movement Depth to bedrock Shallow to densic materials Large stones Droughty	1.00 1.00 1.00 1.00 1.00 1.00 1.00	Very limited Slow water movement Depth to bedrock Shallow to densic materials Droughty Too steep	1.00 1.00 1.00 1.00 1.00 1.00 1.00
OnE: Owens-----	85	Very limited Slow water movement Shallow to densic materials Large stones Depth to bedrock Dense layer	1.00 1.00 1.00 1.00 1.00 1.00 1.00	Very limited Slow water movement Shallow to densic materials Depth to bedrock Droughty Slope	1.00 1.00 1.00 1.00 0.95 0.04
Ow: Oil-waste land-----	100	Not rated		Not rated	
PaA: Padgett-----	90	Very limited Slow water movement Flooding Runoff Sodium content	1.00 0.60 0.40 0.08	Very limited Slow water movement Flooding Sodium content	1.00 1.00 0.08
PaD: Palopinto-----	85	Very limited Droughty Large stones Depth to bedrock Cobble content Runoff	1.00 1.00 1.00 1.00 0.40	Very limited Droughty Depth to bedrock Cobble content Large stones on the surface	1.00 1.00 1.00 0.32

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Table 8.--Agricultural Disposal of Manure, Food-Processing Waste, and Sewage Sludge --Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge	
		Rating class and limiting features	Value	Rating class and limiting features	Value
QU: Pits, quarry-----	100	Not rated		Not rated	
RwB: Rowden-----	85	Very limited Slow water movement Runoff Depth to bedrock Droughty	1.00 0.40 0.10 0.10	Very limited Slow water movement Depth to bedrock Droughty	1.00 0.10 0.10
SaA: Sagerton-----	85	Somewhat limited Slow water movement	0.50	Somewhat limited Slow water movement	0.37
SaB: Sagerton-----	85	Somewhat limited Slow water movement	0.50	Somewhat limited Slow water movement	0.37
ScB: Springcreek-----	85	Very limited Droughty Depth to bedrock	1.00 0.46	Very limited Droughty Depth to bedrock	1.00 0.46
SeB: Set-----	85	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00
SpG: Set-----	50	Very limited Slow water movement Large stones Too steep Large stones on the surface	1.00 1.00 1.00 0.50	Very limited Slow water movement Too steep Large stones on the surface	1.00 1.00 0.50
Palopinto-----	40	Very limited Droughty Large stones Depth to bedrock Cobble content Slope	1.00 1.00 1.00 1.00 0.96	Very limited Droughty Depth to bedrock Cobble content Slope Large stones on the surface	1.00 1.00 1.00 0.96 0.32
StF: Shatruce-----	85	Very limited Slow water movement Large stones Too steep Depth to bedrock Shallow to densic materials	1.00 1.00 1.00 0.80 0.79	Very limited Slow water movement Too steep Depth to bedrock Shallow to densic materials	1.00 1.00 0.80 0.79

Soil Survey of Young County, Texas

Table 8.--Agricultural Disposal of Manure, Food-Processing Waste, and Sewage Sludge --Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge	
		Rating class and limiting features	Value	Rating class and limiting features	Value
StG: Shatruce-----	85	Very limited Slow water movement Large stones Too steep Runoff Depth to bedrock	1.00 1.00 1.00 0.40 0.16	Very limited Slow water movement Too steep Depth to bedrock Shallow to densic materials	1.00 1.00 0.16 0.15
ThB: Thurber-----	85	Very limited Slow water movement Runoff Sodium content	1.00 0.40 0.18	Very limited Slow water movement Sodium content	1.00 0.18
TkC: Throck-----	85	Very limited Slow water movement Sodium content	1.00 0.08	Very limited Slow water movement Sodium content	1.00 0.08
TmB: Tillman-----	85	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00
TrB: Truce-----	85	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00
TrC: Truce-----	85	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00
VeC: Vernon-----	85	Very limited Slow water movement Sodium content Depth to bedrock Shallow to densic materials Runoff	1.00 0.68 0.65 0.64 0.40	Very limited Slow water movement Sodium content Depth to bedrock Shallow to densic materials Droughty	1.00 0.68 0.65 0.64 0.20
W: Water-----	100	Not rated		Not rated	
WaA: Westola-----	90	Somewhat limited Flooding Leaching	0.60 0.45	Very limited Flooding	1.00

Soil Survey of Young County, Texas

Table 8.--Agricultural Disposal of Manure, Food-Processing Waste, and Sewage Sludge --Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food- processing waste		Application of sewage sludge	
		Rating class and limiting features	Value	Rating class and limiting features	Value
WdB: Weswind-----	85	Very limited Slow water movement Too acid	1.00 0.03	Very limited Slow water movement Too acid	1.00 0.14
WeA: Wheatwood-----	90	Somewhat limited Flooding	0.60	Very limited Flooding	1.00
WhB: Wichita-----	90	Somewhat limited Slow water movement	0.30	Somewhat limited Slow water movement	0.22
WtB: Winters-----	85	Somewhat limited Slow water movement	0.50	Somewhat limited Slow water movement	0.37

Soil Survey of Young County, Texas

Table 9.--Agricultural Disposal of Wastewater by Irrigation and Overland Flow

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation		Overland flow of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AbA: Abilene-----	85	Somewhat limited Slow water movement	0.37	Very limited Seepage	1.00
				Too level	0.50
AnB: Anocon-----	90	Somewhat limited Slow water movement	0.37	Very limited Seepage	1.00
BgB: Bluegrove-----	90	Somewhat limited Slow water movement	0.22	Very limited Seepage	1.00
		Depth to bedrock	0.16	Depth to bedrock	1.00
		Droughty	0.01		
BoB: Bonti-----	85	Somewhat limited Droughty	0.86	Very limited Seepage	1.00
		Depth to bedrock	0.80	Depth to bedrock	1.00
		Slow water movement	0.37		
BpC: Bastrop-----	90	Not limited		Very limited Seepage	1.00
BsB: Bastrop-----	85	Not limited		Very limited Seepage	1.00
BsC2: Bastrop, eroded----	85	Not limited		Very limited Seepage	1.00
CaC2: Callahan-----	90	Very limited Slow water movement	1.00	Very limited Depth to bedrock	1.00
		Depth to bedrock	0.16	Seepage	0.62
		Too steep for surface application	0.08		
ChB: Chaney-----	85	Very limited Slow water movement	1.00	Very limited Seepage	1.00
				Depth to bedrock	0.02

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Table 9.--Agricultural Disposal of Wastewater by Irrigation and Overland Flow--Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation		Overland flow of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
CkA: Clearfork-----	90	Somewhat limited Flooding Slow water movement	0.60 0.37	Very limited Flooding Seepage Too level	1.00 0.62 0.50
DAM: Dams-----	100	Not rated		Not rated	
DeB: Decordova-----	90	Not limited		Very limited Seepage	1.00
DnB: Deandale-----	90	Very limited Slow water movement Sodium content	1.00 0.68	Very limited Seepage Sodium content	1.00 0.68
EnB: Enterprise-----	85	Not limited		Very limited Seepage	1.00
EnC: Enterprise-----	85	Somewhat limited Too steep for surface application	0.08	Very limited Seepage	1.00
ExD: Exray-----	43	Very limited Droughty Depth to bedrock Large stones on the surface Slow water movement Too steep for surface application	1.00 1.00 0.50 0.37 0.32	Very limited Depth to bedrock Seepage	1.00 1.00
Loving-----	33	Very limited Droughty Depth to bedrock Large stones on the surface Too steep for surface application	1.00 1.00 1.00 0.32	Very limited Seepage Depth to bedrock	1.00 1.00
GaB: Gageby-----	90	Somewhat limited Flooding	0.60	Very limited Flooding Seepage Too level	1.00 1.00 0.18

Soil Survey of Young County, Texas

Table 9.--Agricultural Disposal of Wastewater by Irrigation and Overland Flow--Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation		Overland flow of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
GdF: Goodnight-----	90	Very limited Too steep for surface application Filtering capacity Too steep for sprinkler application Droughty	1.00 0.99 0.40 0.01	Very limited Seepage Too steep for surface application	1.00 0.78
GeA: Gowen-----	90	Somewhat limited Flooding	0.60	Very limited Flooding Seepage Too level	1.00 1.00 0.50
GfB: Grandfield-----	90	Not limited		Very limited Seepage	1.00
GnB: Grandfield-----	90	Not limited		Very limited Seepage	1.00
GnC: Grandfield-----	90	Somewhat limited Too steep for surface application	0.08	Very limited Seepage	1.00
GrB: Grandmore-----	85	Somewhat limited Slow water movement	0.37	Very limited Seepage	1.00
HeC: Heaton-----	85	Not limited		Very limited Seepage	1.00
HnB: Hensley-----	85	Very limited Droughty Depth to bedrock Slow water movement	1.00 1.00 1.00	Very limited Depth to bedrock Seepage	1.00 0.62
HsB: Hensley-----	85	Very limited Droughty Depth to bedrock Slow water movement Cobble content Large stones on the surface	1.00 1.00 1.00 1.00 0.18	Very limited Depth to bedrock Seepage	1.00 0.62

Soil Survey of Young County, Texas

Table 9.--Agricultural Disposal of Wastewater by Irrigation and Overland Flow--Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation		Overland flow of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
JaB: Jacksboro-----	90	Very limited Droughty Depth to bedrock Slow water movement	1.00 1.00 0.37	Very limited Seepage Depth to bedrock	1.00 1.00
JrE: Jolly-----	68	Very limited Droughty Depth to bedrock Too steep for surface application	1.00 1.00 0.32	Very limited Seepage Depth to bedrock	1.00 1.00
Rock outcrop-----	17	Not rated		Not rated	
KaA: Kamay-----	85	Very limited Slow water movement Sodium content	1.00 1.00	Very limited Seepage Sodium content	1.00 1.00
KvE: Knoco-----	54	Very limited Slow water movement Depth to bedrock Droughty Too steep for surface application Too steep for sprinkler application	1.00 1.00 1.00 0.92 0.02	Very limited Depth to bedrock Too steep for surface application	1.00 0.06
Vernon-----	41	Very limited Slow water movement Depth to bedrock Sodium content Too steep for surface application	1.00 0.84 0.68 0.32	Very limited Depth to bedrock Sodium content	1.00 0.68
KvG: Knoco-----	35	Very limited Slow water movement Too steep for surface application Depth to bedrock Droughty Too steep for sprinkler application	1.00 1.00 1.00 1.00 1.00	Very limited Depth to bedrock Too steep for surface application	1.00 1.00

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Table 9.--Agricultural Disposal of Wastewater by Irrigation and Overland Flow--Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation		Overland flow of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
KvG: Vernon-----	30	Very limited Slow water movement Too steep for surface application Depth to bedrock Sodium content Too steep for sprinkler application	1.00 1.00 0.99 0.68 0.10	Very limited Depth to bedrock Sodium content Too steep for surface application	1.00 0.68 0.22
LeB: Leeray-----	85	Very limited Slow water movement	1.00	Not limited	
LnA: Lincoln-----	90	Somewhat limited Filtering capacity Flooding Droughty	0.99 0.60 0.47	Very limited Flooding Seepage Too level	1.00 1.00 0.50
LyB: Lindy-----	85	Very limited Slow water movement Depth to bedrock Droughty	1.00 0.29 0.25	Very limited Seepage Depth to bedrock	1.00 1.00
MwB: Minwells-----	85	Very limited Slow water movement	1.00	Very limited Seepage	1.00
NcB: Newcastle-----	85	Very limited Slow water movement Filtering capacity Droughty Too acid Depth to bedrock	1.00 0.99 0.69 0.42 0.03	Very limited Seepage Depth to bedrock Too acid	1.00 1.00 0.42
NeB: Newcastle-----	88	Very limited Slow water movement Droughty Depth to bedrock	1.00 0.95 0.65	Very limited Seepage Depth to bedrock	1.00 1.00

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Table 9.--Agricultural Disposal of Wastewater by Irrigation and Overland Flow--Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation		Overland flow of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
NoC: Newcastle-----	45	Very limited Slow water movement Droughty Depth to bedrock	1.00 0.43 0.20	Very limited Seepage Depth to bedrock	1.00 1.00
Jolly-----	40	Very limited Droughty Depth to bedrock	1.00 1.00	Very limited Seepage Depth to bedrock	1.00 1.00
NuA: Nukrum-----	85	Very limited Slow water movement	1.00	Somewhat limited Too level	0.50
OhG: Owens-----	59	Very limited Slow water movement Too steep for surface application Depth to bedrock Too steep for sprinkler application Droughty	1.00 1.00 1.00 1.00 0.88	Very limited Depth to bedrock Too steep for surface application	1.00 1.00
Harpersville-----	36	Very limited Slow water movement Depth to bedrock Too steep for surface application Droughty Too steep for sprinkler application	1.00 1.00 1.00 1.00 1.00	Very limited Depth to bedrock Too steep for surface application	1.00 1.00
OnE: Owens-----	85	Very limited Slow water movement Depth to bedrock Too steep for surface application Droughty Too steep for sprinkler application	1.00 1.00 1.00 0.95 0.22	Very limited Depth to bedrock Too steep for surface application	1.00 0.50

Soil Survey of Young County, Texas

Table 9.--Agricultural Disposal of Wastewater by Irrigation and Overland Flow--Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation		Overland flow of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Ow: Oil-waste land-----	100	Not rated		Not rated	
PaA: Padgett-----	90	Very limited Slow water movement Flooding Sodium content	1.00 0.60 0.08	Very limited Flooding Too level Sodium content	1.00 0.50 0.08
PaD: Palopinto-----	85	Very limited Droughty Depth to bedrock Cobble content Large stones on the surface	1.00 1.00 1.00 0.32	Very limited Depth to bedrock Seepage	1.00 1.00
QU: Pits, quarry-----	100	Not rated		Not rated	
RwB: Rowden-----	85	Very limited Slow water movement Depth to bedrock Droughty	1.00 0.10 0.10	Very limited Seepage Depth to bedrock	1.00 1.00
SaA: Sagerton-----	85	Somewhat limited Slow water movement	0.37	Very limited Seepage Too level	1.00 0.50
SaB: Sagerton-----	85	Somewhat limited Slow water movement	0.37	Very limited Seepage	1.00
ScB: Springcreek-----	85	Very limited Droughty Depth to bedrock	1.00 0.46	Very limited Seepage Depth to bedrock	1.00 1.00
SeB: Set-----	85	Very limited Slow water movement	1.00	Somewhat limited Depth to bedrock	0.26

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Table 9.--Agricultural Disposal of Wastewater by Irrigation and Overland Flow--Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation		Overland flow of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
SpG: Set-----	50	Very limited Slow water movement	1.00	Very limited Too steep for surface application	1.00
		Too steep for surface application	1.00	Depth to bedrock	0.88
		Too steep for sprinkler application	1.00		
		Large stones on the surface	0.50		
Palopinto-----	40	Very limited Droughty	1.00	Very limited Depth to bedrock	1.00
		Too steep for surface application	1.00	Seepage	1.00
		Depth to bedrock	1.00	Too steep for surface application	1.00
		Cobble content Too steep for sprinkler application	1.00 0.98	Cobble content	0.11
StF: Shatruce-----	85	Very limited Slow water movement	1.00	Very limited Seepage	1.00
		Too steep for surface application	1.00	Depth to bedrock	1.00
		Too steep for sprinkler application	1.00	Too steep for surface application	1.00
		Depth to bedrock	0.80		
StG: Shatruce-----	85	Very limited Slow water movement	1.00	Very limited Seepage	1.00
		Too steep for surface application	1.00	Too steep for surface application	1.00
		Too steep for sprinkler application	1.00	Depth to bedrock	1.00
		Depth to bedrock	0.16		
ThB: Thurber-----	85	Very limited Slow water movement	1.00	Somewhat limited Seepage	0.62
		Sodium content	0.18	Sodium content	0.18

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Table 9.--Agricultural Disposal of Wastewater by Irrigation and Overland Flow--Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation		Overland flow of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
TkC: Throck-----	85	Very limited Slow water movement Sodium content	1.00 0.08	Somewhat limited Seepage Depth to bedrock Sodium content	0.62 0.61 0.08
TmB: Tillman-----	85	Very limited Slow water movement	1.00	Somewhat limited Seepage	0.62
TrB: Truce-----	85	Very limited Slow water movement	1.00	Very limited Seepage Depth to bedrock	1.00 0.05
TrC: Truce-----	85	Very limited Slow water movement Too steep for surface application	1.00 0.08	Very limited Seepage Depth to bedrock	1.00 0.88
VeC: Vernon-----	85	Very limited Slow water movement Sodium content Depth to bedrock Droughty	1.00 0.68 0.65 0.20	Very limited Depth to bedrock Sodium content	1.00 0.68
W: Water-----	100	Not rated		Not rated	
WaA: Westola-----	90	Somewhat limited Flooding	0.60	Very limited Flooding Seepage Too level	1.00 1.00 0.50
WdB: Weswind-----	85	Very limited Slow water movement Too acid	1.00 0.14	Very limited Seepage Too acid	1.00 0.14
WeA: Wheatwood-----	90	Somewhat limited Flooding	0.60	Very limited Flooding Seepage Too level	1.00 1.00 0.50

Soil Survey of Young County, Texas

Table 9.--Agricultural Disposal of Wastewater by Irrigation and Overland Flow--Continued

Map symbol and soil name	Pct. of map unit	Disposal of wastewater by irrigation		Overland flow of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
WhB: Wichita-----	90	Somewhat limited Slow water movement	0.22	Very limited Seepage	1.00
WtB: Winters-----	85	Somewhat limited Slow water movement	0.37	Very limited Seepage	1.00

Soil Survey of Young County, Texas

Table 10.--Agricultural Disposal of Wastewater by Rapid Infiltration and Slow Rate Treatment

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AbA: Abilene-----	85	Very limited Slow water movement	1.00	Somewhat limited Slow water movement	0.26
AnB: Anocon-----	90	Very limited Slow water movement	1.00	Somewhat limited Slow water movement	0.26
BgB: Bluegrove-----	90	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Slow water movement	1.00 0.15
BoB: Bonti-----	85	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Slow water movement	1.00 0.26
BpC: Bastrop-----	90	Very limited Slow water movement	1.00	Not limited	
BsB: Bastrop-----	85	Very limited Slow water movement	1.00	Not limited	
BsC2: Bastrop, eroded-----	85	Very limited Slow water movement	1.00	Not limited	
CaC2: Callahan-----	90	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Slow water movement Depth to bedrock Too steep for surface application	1.00 1.00 0.08
ChB: Chaney-----	85	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Slow water movement Depth to bedrock	1.00 0.02

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Table 10.--Agricultural Disposal of Wastewater by Rapid Infiltration and Slow Rate Treatment--Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
CkA: Clearfork-----	90	Very limited Slow water movement Flooding	1.00 0.60	Somewhat limited Flooding Slow water movement	0.60 0.26
DAM: Dams-----	100	Not rated		Not rated	
DeB: Decordova-----	90	Somewhat limited Slow water movement	0.32	Not limited	
DnB: Deandale-----	90	Very limited Slow water movement	1.00	Very limited Slow water movement Sodium content	1.00 0.68
EnB: Enterprise-----	85	Somewhat limited Slow water movement	0.32	Not limited	
EnC: Enterprise-----	85	Somewhat limited Slow water movement	0.32	Somewhat limited Too steep for surface application	0.08
ExD: Exray-----	43	Very limited Slow water movement Depth to bedrock Slope Stone content	1.00 1.00 0.12 0.02	Very limited Depth to bedrock Large stones on the surface Too steep for surface application Slow water movement	1.00 0.50 0.32 0.26
Loving-----	33	Very limited Depth to bedrock Stone content Slow water movement Slope	1.00 0.55 0.32 0.12	Very limited Depth to bedrock Large stones on the surface Too steep for surface application	1.00 1.00 0.32
GaB: Gageby-----	90	Very limited Slow water movement Flooding	1.00 0.60	Somewhat limited Flooding	0.60

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Table 10.--Agricultural Disposal of Wastewater by Rapid Infiltration and Slow Rate Treatment--Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
GdF: Goodnight-----	90	Very limited Slope	1.00	Very limited Too steep for surface application Filtering capacity Too steep for sprinkler irrigation	1.00 0.99 0.78
GeA: Gowen-----	90	Very limited Slow water movement Flooding	1.00 0.60	Somewhat limited Flooding	0.60
GfB: Grandfield-----	90	Very limited Slow water movement	1.00	Not limited	
GnB: Grandfield-----	90	Very limited Slow water movement	1.00	Not limited	
GnC: Grandfield-----	90	Very limited Slow water movement	1.00	Somewhat limited Too steep for surface application	0.08
GrB: Grandmore-----	85	Very limited Slow water movement	1.00	Somewhat limited Slow water movement	0.26
HeC: Heaton-----	85	Very limited Slow water movement	1.00	Not limited	
HnB: Hensley-----	85	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Slow water movement	1.00 0.94
HsB: Hensley-----	85	Very limited Slow water movement Depth to bedrock Cobble content	1.00 1.00 0.03	Very limited Depth to bedrock Cobble content Slow water movement Large stones on the surface	1.00 1.00 0.94 0.18

Soil Survey of Young County, Texas

Table 10.--Agricultural Disposal of Wastewater by Rapid Infiltration and Slow Rate Treatment--Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
JaB: Jacksboro-----	90	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Slow water movement	1.00 0.26
JrE: Jolly-----	68	Very limited Depth to bedrock Slow water movement Slope	1.00 1.00 0.12	Very limited Depth to bedrock Too steep for surface application	1.00 0.32
Rock outcrop-----	17	Not rated		Not rated	
KaA: Kamay-----	85	Very limited Slow water movement	1.00	Very limited Slow water movement Sodium content	1.00 1.00
KvE: Knoco-----	54	Very limited Slow water movement Depth to bedrock Slope	1.00 1.00 0.88	Very limited Depth to bedrock Slow water movement Too steep for surface application Too steep for sprinkler irrigation	1.00 1.00 0.92 0.06
Vernon-----	41	Very limited Slow water movement Depth to bedrock Slope	1.00 1.00 0.12	Very limited Slow water movement Depth to bedrock Sodium content Too steep for surface application	1.00 1.00 0.68 0.32
KvG: Knoco-----	35	Very limited Slope Slow water movement Depth to bedrock	1.00 1.00 1.00	Very limited Depth to bedrock Too steep for surface application Slow water movement Too steep for sprinkler irrigation	1.00 1.00 1.00 1.00

Soil Survey of Young County, Texas

Table 10.--Agricultural Disposal of Wastewater by Rapid Infiltration and Slow Rate Treatment--Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Vernon-----	30	Very limited Slow water movement Depth to bedrock Slope	1.00 1.00 1.00	Very limited Slow water movement Depth to bedrock Too steep for surface application Sodium content Too steep for sprinkler irrigation	1.00 1.00 1.00 0.68 0.22
LeB: Leeray-----	85	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00
LnA: Lincoln-----	90	Somewhat limited Flooding	0.60	Somewhat limited Filtering capacity Flooding	0.99 0.60
LyB: Lindy-----	85	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Slow water movement	1.00 0.94
MwB: Minwells-----	85	Very limited Slow water movement	1.00	Somewhat limited Slow water movement	0.94
NcB: Newcastle-----	85	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Filtering capacity Slow water movement Too acid	1.00 0.99 0.94 0.42
NeB: Newcastle-----	88	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Slow water movement	1.00 0.94
NoC: Newcastle-----	45	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Slow water movement	1.00 0.94

Soil Survey of Young County, Texas

Table 10.--Agricultural Disposal of Wastewater by Rapid Infiltration and Slow Rate Treatment--Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Jolly-----	40	Very limited Depth to bedrock Slow water movement	1.00 1.00	Very limited Depth to bedrock	1.00
NuA: Nukrum-----	85	Very limited Slow water movement	1.00	Somewhat limited Slow water movement	0.94
OhG: Owens-----	59	Very limited Slope	1.00	Very limited Slow water movement	1.00
		Slow water movement	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep for surface application	1.00
				Too steep for sprinkler irrigation	1.00
Harpersville-----	36	Very limited Slope	1.00	Very limited Slow water movement	1.00
		Slow water movement	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Too steep for surface application	1.00
				Too steep for sprinkler irrigation	1.00
OnE: Owens-----	85	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Too steep for surface application	1.00
				Too steep for sprinkler irrigation	0.50
Ow: Oil-waste land-----	100	Not rated		Not rated	
PaA: Padgett-----	90	Very limited Slow water movement	1.00	Very limited Slow water movement	1.00
		Flooding	0.60	Flooding	0.60
				Sodium content	0.08

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Table 10.--Agricultural Disposal of Wastewater by Rapid Infiltration and Slow Rate Treatment--Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
PaD: Palopinto-----	85	Very limited Depth to bedrock Cobble content Slow water movement Stone content	1.00 1.00 1.00 0.38	Very limited Depth to bedrock Cobble content Large stones on the surface	1.00 1.00 0.32
QU: Pits, quarry-----	100	Not rated		Not rated	
RwB: Rowden-----	85	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Slow water movement	1.00 0.94
SaA: Sagerton-----	85	Very limited Slow water movement	1.00	Somewhat limited Slow water movement	0.26
SaB: Sagerton-----	85	Very limited Slow water movement	1.00	Somewhat limited Slow water movement	0.26
ScB: Springcreek-----	85	Very limited Depth to bedrock Slow water movement	1.00 1.00	Very limited Depth to bedrock	1.00
SeB: Set-----	85	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Slow water movement Depth to bedrock	1.00 0.26
SpG: Set-----	50	Very limited Slope Slow water movement Depth to bedrock	1.00 1.00 1.00	Very limited Too steep for surface application Slow water movement Too steep for sprinkler irrigation Depth to bedrock Large stones on the surface	1.00 1.00 1.00 0.88 0.50

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Table 10.--Agricultural Disposal of Wastewater by Rapid Infiltration and Slow Rate Treatment--Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Palopinto-----	40	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Too steep for surface application	1.00 1.00
		Cobble content Slow water movement	1.00 1.00	Cobble content Too steep for sprinkler irrigation	1.00 1.00
		Stone content	0.44	Large stones on the surface	0.32
StF: Shatruce-----	85	Very limited Slope	1.00	Very limited Too steep for surface application	1.00
		Slow water movement Depth to bedrock	1.00 1.00	Slow water movement Depth to bedrock Too steep for sprinkler irrigation	1.00 1.00
StG: Shatruce-----	85	Very limited Slope	1.00	Very limited Too steep for surface application	1.00
		Slow water movement Depth to bedrock	1.00 1.00	Too steep for sprinkler irrigation Slow water movement Depth to bedrock	1.00 1.00
ThB: Thurber-----	85	Very limited Slow water movement	1.00	Very limited Slow water movement Sodium content	1.00 0.18
TkC: Throck-----	85	Very limited Slow water movement Depth to bedrock	1.00 1.00	Somewhat limited Slow water movement Depth to bedrock Sodium content	0.94 0.61 0.08
TmB: Tillman-----	85	Very limited Slow water movement	1.00	Somewhat limited Slow water movement	0.94

Soil Survey of Young County, Texas

Table 10.--Agricultural Disposal of Wastewater by Rapid Infiltration and Slow Rate Treatment--Continued

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
TrB: Truce-----	85	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Slow water movement Depth to bedrock	1.00 0.05
TrC: Truce-----	85	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Slow water movement Depth to bedrock Too steep for surface application	1.00 0.88 0.08
VeC: Vernon-----	85	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Slow water movement Depth to bedrock Sodium content	1.00 1.00 0.68
W: Water-----	100	Not rated		Not rated	
WaA: Westola-----	90	Somewhat limited Flooding Slow water movement	0.60 0.32	Somewhat limited Flooding	0.60
WdB: Weswind-----	85	Very limited Slow water movement	1.00	Somewhat limited Slow water movement Too acid	0.94 0.14
WeA: Wheatwood-----	90	Very limited Slow water movement Flooding	1.00 0.60	Somewhat limited Flooding	0.60
WhB: Wichita-----	90	Very limited Slow water movement	1.00	Somewhat limited Slow water movement	0.15
WtB: Winters-----	85	Very limited Slow water movement	1.00	Somewhat limited Slow water movement	0.26

Soil Survey of Young County, Texas

Table 11.--Camp Areas, Picnic Areas, and Playgrounds

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AbA: Abilene-----	85	Not limited		Not limited		Not limited	
AnB: Anocon-----	90	Not limited		Not limited		Not limited	
BgB: Bluegrove-----	90	Not limited		Not limited		Not limited	
BoB: Bonti-----	85	Not limited		Not limited		Not limited	
BpC: Bastrop-----	90	Somewhat limited Too sandy	0.92	Somewhat limited Too sandy	0.92	Somewhat limited Too sandy Slope	0.92 0.12
BsB: Bastrop-----	85	Not limited		Not limited		Not limited	
BsC2: Bastrop, eroded-----	85	Not limited		Not limited		Somewhat limited Slope	0.12
CaC2: Callahan-----	90	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slope Slow water movement Depth to bedrock	0.50 0.39 0.16
ChB: Chaney-----	85	Somewhat limited Too sandy Slow water movement	0.79 0.39	Somewhat limited Too sandy Slow water movement	0.79 0.39	Somewhat limited Too sandy Slow water movement	0.79 0.39
CkA: Clearfork-----	90	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
DAM: Dams-----	100	Not rated		Not rated		Not rated	
DeB: Decordova-----	90	Somewhat limited Too sandy	0.70	Somewhat limited Too sandy	0.70	Somewhat limited Too sandy	0.70

Soil Survey of Young County, Texas

Table 11.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DnB: Deandale-----	90	Somewhat limited Slow water movement	0.45	Somewhat limited Slow water movement	0.45	Somewhat limited Slow water movement	0.45
EnB: Enterprise-----	85	Not limited		Not limited		Not limited	
EnC: Enterprise-----	85	Not limited		Not limited		Somewhat limited Slope	0.50
ExD: Exray-----	43	Very limited Large stones content Depth to bedrock	1.00 1.00	Very limited Large stones content Depth to bedrock	1.00 1.00	Very limited Large stones content Depth to bedrock Slope	1.00 1.00 0.88
Loving-----	33	Very limited Large stones content Depth to bedrock	1.00 1.00	Very limited Large stones content Depth to bedrock	1.00 1.00	Very limited Large stones content Depth to bedrock Slope	1.00 1.00 0.88
GaB: Gageby-----	90	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
GdF: Goodnight-----	90	Somewhat limited Too sandy Slope	0.87 0.16	Somewhat limited Too sandy Slope	0.87 0.16	Very limited Slope Too sandy	1.00 0.87
GeA: Gowen-----	90	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
GfB: Grandfield-----	90	Somewhat limited Too sandy	0.92	Somewhat limited Too sandy	0.92	Somewhat limited Too sandy	0.92
GnB: Grandfield-----	90	Not limited		Not limited		Not limited	
GnC: Grandfield-----	90	Not limited		Not limited		Somewhat limited Slope	0.50
GrB: Grandmore-----	85	Not limited		Not limited		Not limited	
HeC: Heaton-----	85	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Very limited Too sandy Slope	1.00 0.12

Soil Survey of Young County, Texas

Table 11.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HnB: Hensley-----	85	Very limited Depth to bedrock Slow water movement	1.00 0.39	Very limited Depth to bedrock Slow water movement	1.00 0.39	Very limited Depth to bedrock Slow water movement Gravel	1.00 0.39 0.05
HsB: Hensley-----	85	Very limited Large stones content Depth to bedrock Slow water movement	1.00 1.00 0.39	Very limited Large stones content Depth to bedrock Slow water movement	1.00 1.00 0.39	Very limited Large stones content Depth to bedrock Slow water movement	1.00 1.00 0.39
JaB: Jacksboro-----	90	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Gravel	1.00 0.21
JrE: Jolly-----	68	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope	1.00 0.88
Rock outcrop-----	17	Not rated		Not rated		Not rated	
KaA: Kamay-----	85	Very limited Sodium content Slow water movement	1.00 0.45	Very limited Sodium content Slow water movement	1.00 0.45	Very limited Sodium content Slow water movement	1.00 0.45
KvE: Knoco-----	54	Very limited Depth to bedrock Too clayey Slow water movement	1.00 0.50 0.45	Very limited Depth to bedrock Too clayey Slow water movement	1.00 0.50 0.45	Very limited Depth to bedrock Slope Too clayey Slow water movement	1.00 1.00 0.50 0.45
Vernon-----	41	Very limited Large stones content Sodium content Too clayey Slow water movement	1.00 1.00 0.50 0.45	Very limited Large stones content Sodium content Too clayey Slow water movement	1.00 1.00 0.50 0.45	Very limited Large stones content Sodium content Slope Depth to bedrock Too clayey	1.00 1.00 0.88 0.84 0.50

Soil Survey of Young County, Texas

Table 11.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KvG:							
Knoco-----	35	Very limited Large stones content Too steep Depth to bedrock Too clayey Slow water movement	1.00 1.00 1.00 0.50 0.45	Very limited Large stones content Too steep Depth to bedrock Too clayey Slow water movement	1.00 1.00 1.00 0.50 0.45	Very limited Large stones content Slope Depth to bedrock Too clayey Slow water movement	1.00 1.00 1.00 0.50 0.45
Vernon-----	30	Very limited Large stones content Sodium content Too clayey Slow water movement Slope	1.00 1.00 0.50 0.45 0.01	Very limited Large stones content Sodium content Too clayey Slow water movement Slope	1.00 1.00 0.50 0.45 0.01	Very limited Large stones content Slope Sodium content Depth to bedrock Too clayey	1.00 1.00 1.00 0.99 0.50
LeB:							
Leeray-----	85	Very limited Sodium content Too clayey Slow water movement	1.00 0.50 0.45	Very limited Sodium content Too clayey Slow water movement	1.00 0.50 0.45	Very limited Sodium content Too clayey Slow water movement	1.00 0.50 0.45
LnA:							
Lincoln-----	90	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
LyB:							
Lindy-----	85	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39
MwB:							
Minwells-----	85	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39
NcB:							
Newcastle-----	85	Somewhat limited Too sandy	0.79	Somewhat limited Too sandy	0.79	Somewhat limited Too sandy	0.79
NeB:							
Newcastle-----	88	Not limited		Not limited		Not limited	
NoC:							
Newcastle-----	45	Not limited		Not limited		Not limited	
Jolly-----	40	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope	1.00 0.12
NuA:							
Nukrum-----	85	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39

Soil Survey of Young County, Texas

Table 11.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
OhG: Owens-----	59	Very limited Large stones content Too steep Depth to bedrock Too clayey Slow water movement	1.00 1.00 1.00 0.50 0.45	Very limited Large stones content Too steep Depth to bedrock Too clayey Slow water movement	1.00 1.00 1.00 0.50 0.45	Very limited Large stones content Slope Depth to bedrock Too clayey Slow water movement	1.00 1.00 1.00 0.50 0.45
Harpersville-----	36	Very limited Large stones content Depth to bedrock Too steep Too clayey Slow water movement	1.00 1.00 1.00 0.50 0.45	Very limited Large stones content Depth to bedrock Too steep Too clayey Slow water movement	1.00 1.00 1.00 0.50 0.45	Very limited Large stones content Slope Depth to bedrock Too clayey Slow water movement	1.00 1.00 1.00 0.50 0.45
OnE: Owens-----	85	Very limited Large stones content Depth to bedrock Too clayey Slow water movement Slope	1.00 1.00 0.50 0.45 0.04	Very limited Large stones content Depth to bedrock Too clayey Slow water movement Slope	1.00 1.00 0.50 0.45 0.04	Very limited Large stones content Slope Depth to bedrock Too clayey Slow water movement	1.00 1.00 1.00 0.50 0.45
Ow: Oil-waste land-----	100	Not rated		Not rated		Not rated	
PaA: Padgett-----	90	Very limited Flooding Too clayey Slow water movement	1.00 0.50 0.45	Somewhat limited Too clayey Slow water movement	0.50 0.45	Somewhat limited Flooding Too clayey Slow water movement	0.60 0.50 0.45
PaD: Palopinto-----	85	Very limited Large stones content Depth to bedrock	1.00 1.00	Very limited Large stones content Depth to bedrock	1.00 1.00	Very limited Large stones content Depth to bedrock Slope	1.00 1.00 0.12
QU: Pits, quarry-----	100	Not rated		Not rated		Not rated	
RwB: Rowden-----	85	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement Gravel	0.39 0.04
SaA: Sagerton-----	85	Not limited		Not limited		Not limited	

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Table 11.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SaB: Sagerton-----	85	Not limited		Not limited		Not limited	
ScB: Springcreek-----	85	Not limited		Not limited		Not limited	
SeB: Set-----	85	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39
SpG: Set-----	50	Very limited Large stones content Too steep Slow water movement	1.00 1.00 0.39	Very limited Large stones content Too steep Slow water movement	1.00 1.00 0.39	Very limited Large stones content Slope Slow water movement	1.00 1.00 0.39
Palopinto-----	40	Very limited Large stones content Depth to bedrock Slope	1.00 1.00 0.96	Very limited Large stones content Depth to bedrock Slope	1.00 1.00 0.96	Very limited Large stones content Slope Depth to bedrock	1.00 1.00 1.00
StF: Shatruce-----	85	Very limited Large stones content Too steep Slow water movement Gravel	1.00 1.00 0.39 0.33	Very limited Large stones content Too steep Slow water movement Gravel	1.00 1.00 0.39 0.33	Very limited Large stones content Slope Gravel Depth to bedrock Slow water movement	1.00 1.00 1.00 1.00 0.80 0.39
StG: Shatruce-----	85	Very limited Large stones content Too steep Slow water movement Gravel	1.00 1.00 0.39 0.33	Very limited Large stones content Too steep Slow water movement Gravel	1.00 1.00 0.39 0.33	Very limited Large stones content Slope Gravel Slow water movement Depth to bedrock	1.00 1.00 1.00 1.00 0.39 0.16
ThB: Thurber-----	85	Somewhat limited Slow water movement	0.45	Somewhat limited Slow water movement	0.45	Somewhat limited Slow water movement	0.45
TkC: Throck-----	85	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Gravel Slow water movement Slope	0.84 0.39 0.12

Soil Survey of Young County, Texas

Table 11.--Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TmB: Tillman-----	85	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39
TrB: Truce-----	85	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39
TrC: Truce-----	85	Somewhat limited Slow water movement	0.39	Somewhat limited Slow water movement	0.39	Somewhat limited Slope	0.50
						Slow water movement	0.39
VeC: Vernon-----	85	Very limited Sodium content	1.00	Very limited Sodium content	1.00	Very limited Sodium content	1.00
		Too clayey	0.50	Too clayey	0.50	Depth to bedrock	0.65
		Slow water movement	0.45	Slow water movement	0.45	Too clayey	0.50
						Slow water movement	0.45
						Slope	0.12
W: Water-----	100	Not rated		Not rated		Not rated	
WaA: Westola-----	90	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
WdB: Weswind-----	85	Not limited		Not limited		Not limited	
WeA: Wheatwood-----	90	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
WhB: Wichita-----	90	Not limited		Not limited		Not limited	
WtB: Winters-----	85	Not limited		Not limited		Not limited	

Soil Survey of Young County, Texas

Table 12.--Paths, Trails, and Golf Course Fairways

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf course fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AbA: Abilene-----	85	Not limited		Not limited		Not limited	
AnB: Anocon-----	90	Not limited		Not limited		Not limited	
BgB: Bluegrove-----	90	Not limited		Not limited		Somewhat limited Depth to bedrock	0.16
BoB: Bonti-----	85	Not limited		Not limited		Somewhat limited Depth to bedrock Droughty	0.80 0.03
BpC: Bastrop-----	90	Somewhat limited Too sandy	0.92	Somewhat limited Too sandy	0.92	Not limited	
BsB: Bastrop-----	85	Not limited		Not limited		Not limited	
BsC2: Bastrop, eroded----	85	Not limited		Not limited		Not limited	
CaC2: Callahan-----	90	Not limited		Not limited		Somewhat limited Depth to bedrock	0.16
ChB: Chaney-----	85	Somewhat limited Too sandy	0.79	Somewhat limited Too sandy	0.79	Very limited Too dense	1.00
CkA: Clearfork-----	90	Not limited		Not limited		Somewhat limited Flooding	0.60
DAM: Dams-----	100	Not rated		Not rated		Not rated	
DeB: Decordova-----	90	Somewhat limited Too sandy	0.70	Somewhat limited Too sandy	0.70	Not limited	
DnB: Deandale-----	90	Not limited		Not limited		Not limited	
EnB: Enterprise-----	85	Not limited		Not limited		Not limited	

Soil Survey of Young County, Texas

Table 12.--Paths, Trails, and Golf Course Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf course fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EnC: Enterprise-----	85	Not limited		Not limited		Not limited	
ExD: Exray-----	43	Very limited Large stones content	1.00	Very limited Large stones content	1.00	Very limited Droughty Depth to bedrock Large stones	1.00 1.00 0.88
Loving-----	33	Very limited Large stones content	1.00	Very limited Large stones content	1.00	Very limited Depth to bedrock Large stones Droughty	1.00 1.00 0.97
GaB: Gageby-----	90	Not limited		Not limited		Somewhat limited Flooding	0.60
GdF: Goodnight-----	90	Somewhat limited Too sandy	0.87	Somewhat limited Too sandy	0.87	Somewhat limited Droughty Slope	0.53 0.16
GeA: Gowen-----	90	Not limited		Not limited		Somewhat limited Flooding	0.60
GfB: Grandfield-----	90	Somewhat limited Too sandy	0.92	Somewhat limited Too sandy	0.92	Not limited	
GnB: Grandfield-----	90	Not limited		Not limited		Not limited	
GnC: Grandfield-----	90	Not limited		Not limited		Not limited	
GrB: Grandmore-----	85	Not limited		Not limited		Not limited	
HeC: Heaton-----	85	Very limited Too sandy	1.00	Very limited Too sandy	1.00	Somewhat limited Droughty	0.10
HnB: Hensley-----	85	Not limited		Not limited		Very limited Depth to bedrock Droughty	1.00 0.95
HsB: Hensley-----	85	Very limited Large stones content	1.00	Very limited Large stones content	1.00	Very limited Large stones Depth to bedrock Droughty	1.00 1.00 0.95

Soil Survey of Young County, Texas

Table 12.--Paths, Trails, and Golf Course Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf course fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
JaB: Jacksboro-----	90	Not limited		Not limited		Very limited Depth to bedrock Droughty	1.00 1.00
JrE: Jolly-----	68	Not limited		Not limited		Very limited Droughty Depth to bedrock	1.00 1.00
Rock outcrop-----	17	Not rated		Not rated		Not rated	
KaA: Kamay-----	85	Not limited		Not limited		Very limited Sodium content	1.00
KvE: Knoco-----	54	Somewhat limited Too clayey	0.50	Somewhat limited Too clayey	0.50	Very limited Depth to bedrock Droughty Too clayey Large stones	1.00 1.00 1.00 0.16
Vernon-----	41	Very limited Large stones content Too clayey	1.00 0.50	Very limited Large stones content Too clayey	1.00 0.50	Very limited Too clayey Sodium content Depth to bedrock Large stones	1.00 1.00 0.84 0.16
KvG: Knoco-----	35	Very limited Large stones content Slope Too clayey	1.00 0.50 0.50	Very limited Large stones content Too clayey	1.00 0.50	Very limited Depth to bedrock Droughty Too steep Too clayey Large stones	1.00 1.00 1.00 1.00 0.16
Vernon-----	30	Very limited Large stones content Too clayey	1.00 0.50	Very limited Large stones content Too clayey	1.00 0.50	Very limited Too clayey Sodium content Depth to bedrock Large stones Slope	1.00 1.00 0.99 0.08 0.01
LeB: Leeray-----	85	Somewhat limited Too clayey	0.50	Somewhat limited Too clayey	0.50	Very limited Too clayey Sodium content	1.00 1.00
LnA: Lincoln-----	90	Not limited		Not limited		Somewhat limited Droughty Flooding	0.89 0.60

Soil Survey of Young County, Texas

Table 12.--Paths, Trails, and Golf Course Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf course fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LyB: Lindy-----	85	Not limited		Not limited		Somewhat limited Depth to bedrock	0.29
MwB: Minwells-----	85	Not limited		Not limited		Not limited	
NcB: Newcastle-----	85	Somewhat limited Too sandy	0.79	Somewhat limited Too sandy	0.79	Somewhat limited Depth to bedrock Large stones	0.03 0.03
NeB: Newcastle-----	88	Not limited		Not limited		Somewhat limited Depth to bedrock Droughty	0.65 0.15
NoC: Newcastle-----	45	Not limited		Not limited		Somewhat limited Depth to bedrock	0.20
Jolly-----	40	Not limited		Not limited		Very limited Depth to bedrock Droughty	1.00 0.86
NuA: Nukrum-----	85	Not limited		Not limited		Not limited	
OhG: Owens-----	59	Very limited Large stones content Too clayey Slope	1.00 0.50 0.32	Very limited Large stones content Too clayey	1.00 0.50	Very limited Depth to bedrock Too steep Too clayey Droughty	1.00 1.00 1.00 0.42
Harpersville-----	36	Very limited Large stones content Slope Too clayey	1.00 1.00 0.50	Very limited Large stones content Too clayey	1.00 0.50	Very limited Depth to bedrock Droughty Too steep Too clayey	1.00 1.00 1.00 1.00
OnE: Owens-----	85	Very limited Large stones content Too clayey	1.00 0.50	Very limited Large stones content Too clayey	1.00 0.50	Very limited Depth to bedrock Too clayey Droughty Slope	1.00 1.00 0.64 0.04
Ow: Oil-waste land-----	100	Not rated		Not rated		Not rated	
PaA: Padgett-----	90	Somewhat limited Too clayey	0.50	Somewhat limited Too clayey	0.50	Very limited Too clayey Flooding	1.00 0.60

Soil Survey of Young County, Texas

Table 12.--Paths, Trails, and Golf Course Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf course fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PaD: Palopinto-----	85	Very limited Large stones content	1.00	Very limited Large stones content	1.00	Very limited Droughty	1.00
						Depth to bedrock Large stones	1.00 1.00
QU: Pits, quarry-----	100	Not rated		Not rated		Not rated	
RwB: Rowden-----	85	Not limited		Not limited		Somewhat limited Depth to bedrock	0.10
SaA: Sagerton-----	85	Not limited		Not limited		Not limited	
SaB: Sagerton-----	85	Not limited		Not limited		Not limited	
ScB: Springcreek-----	85	Not limited		Not limited		Very limited Carbonate content Droughty Depth to bedrock	1.00 0.62 0.46
SeB: Set-----	85	Not limited		Not limited		Very limited Carbonate content	1.00
SpG: Set-----	50	Very limited Large stones content Slope	1.00 0.98	Very limited Large stones content	1.00	Very limited Too steep Carbonate content Large stones	1.00 1.00 0.68
Palopinto-----	40	Very limited Large stones content	1.00	Very limited Large stones content	1.00	Very limited Droughty Depth to bedrock Large stones Slope	1.00 1.00 1.00 0.96
StF: Shatruce-----	85	Very limited Large stones content Slope	1.00 0.32	Very limited Large stones content	1.00	Very limited Too steep Depth to bedrock Gravel Large stones	1.00 1.00 0.80 0.33 0.01
StG: Shatruce-----	85	Very limited Large stones content Slope	1.00 1.00	Very limited Large stones content	1.00	Very limited Too steep Gravel Depth to bedrock Large stones	1.00 1.00 0.33 0.16 0.01

Soil Survey of Young County, Texas

Table 12.--Paths, Trails, and Golf Course Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf course fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ThB: Thurber-----	85	Not limited		Not limited		Not limited	
TkC: Throck-----	85	Not limited		Not limited		Not limited	
TmB: Tillman-----	85	Not limited		Not limited		Not limited	
TrB: Truce-----	85	Not limited		Not limited		Not limited	
TrC: Truce-----	85	Not limited		Not limited		Not limited	
VeC: Vernon-----	85	Somewhat limited Too clayey	0.50	Somewhat limited Too clayey	0.50	Very limited Too clayey Sodium content Depth to bedrock	1.00 1.00 0.65
W: Water-----	100	Not rated		Not rated		Not rated	
WaA: Westola-----	90	Not limited		Not limited		Somewhat limited Flooding	0.60
WdB: Weswind-----	85	Not limited		Not limited		Not limited	
WeA: Wheatwood-----	90	Not limited		Not limited		Somewhat limited Flooding	0.60
WhB: Wichita-----	90	Not limited		Not limited		Not limited	
WtB: Winters-----	85	Not limited		Not limited		Not limited	

Soil Survey of Young County, Texas

Table 13.--Grain and Seed Crops, Domestic Grasses and Legumes, and Irrigated Grain and Seed Crops for Wildlife Habitat

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover		Domestic grasses and legumes for food and cover		Irrigated grain and seed crops for food and cover	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AbA: Abilene-----	85	Not limited		Not limited		Not limited	
AnB: Anocon-----	90	Somewhat limited Droughty	0.08	Not limited		Somewhat limited Droughty	0.08
BgB: Bluegrove-----	90	Very limited HEL wind	1.00	Very limited Potentially or highly erodible Bedrock	1.00 0.16	Very limited HEL wind	1.00
		Potentially or highly erodible Bedrock Droughty	1.00 0.16 0.01			Potentially or highly erodible Bedrock Droughty	1.00 0.16 0.01
BoB: Bonti-----	85	Very limited HEL wind	1.00	Very limited Potentially or highly erodible Bedrock	1.00 0.80	Very limited HEL wind	1.00
		Potentially or highly erodible Droughty Bedrock	1.00 1.00 0.80	Droughty	0.02	Potentially or highly erodible Droughty Bedrock	1.00 1.00 0.80
BpC: Bastrop-----	90	Very limited HEL wind	1.00	Very limited Potentially or highly erodible Too sandy	1.00 0.50	Very limited HEL wind	1.00
		Potentially or highly erodible Too sandy Droughty	1.00 0.50 0.09			Potentially or highly erodible Droughty	1.00 0.09
BsB: Bastrop-----	85	Not limited		Not limited		Not limited	
BsC2: Bastrop, eroded----	85	Very limited Potentially or highly erodible	1.00	Very limited Potentially or highly erodible	1.00	Very limited Potentially or highly erodible	1.00
CaC2: Callahan-----	90	Very limited Percs slowly	1.00	Very limited Potentially or highly erodible Percs slowly	1.00 1.00	Very limited Percs slowly	1.00
		Potentially or highly erodible Bedrock Droughty	1.00 0.16 0.04	Bedrock	0.16	Potentially or highly erodible Bedrock Droughty	1.00 0.16 0.04

Soil Survey of Young County, Texas

Table 13.--Grain and Seed Crops, Domestic Grasses and Legumes, and Irrigated Grain and Seed Crops for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover		Domestic grasses and legumes for food and cover		Irrigated grain and seed crops for food and cover	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ChB: Chaney-----	85	Very limited HEL wind Droughty Too sandy Percs slowly	1.00 0.61 0.50 0.33	Somewhat limited Too sandy Percs slowly	0.50 0.33	Very limited HEL wind Droughty Percs slowly	1.00 0.61 0.33
CkA: Clearfork-----	90	Somewhat limited Too clayey Droughty Flooding	0.93 0.68 0.50	Somewhat limited Too clayey Flooding	0.93 0.50	Somewhat limited Too clayey Droughty Flooding	0.93 0.68 0.50
DAM: Dams-----	100	Not rated		Not rated		Not rated	
DeB: Decordova-----	90	Very limited HEL wind Droughty Too sandy	1.00 0.81 0.50	Somewhat limited Too sandy	0.50	Very limited HEL wind Droughty	1.00 0.81
DnB: Deandale-----	90	Somewhat limited Percs slowly	0.50	Somewhat limited Percs slowly Excess sodium	0.50 0.08	Somewhat limited Percs slowly	0.50
EnB: Enterprise-----	85	Very limited Potentially or highly erodible	1.00	Very limited Potentially or highly erodible	1.00	Very limited Potentially or highly erodible	1.00
EnC: Enterprise-----	85	Very limited Potentially or highly erodible	1.00	Very limited Potentially or highly erodible	1.00	Very limited Potentially or highly erodible	1.00
ExD: Exray-----	43	Very limited Droughty Bedrock Potentially or highly erodible Too gravelly, cobbly, or stony	1.00 1.00 1.00 0.14	Very limited Droughty Potentially or highly erodible Bedrock Too gravelly, cobbly, or stony	1.00 1.00 1.00 0.14	Very limited Droughty Bedrock Potentially or highly erodible Too gravelly, cobbly, or stony Slope	1.00 1.00 1.00 0.14 0.12
Loving-----	33	Very limited Droughty Bedrock Potentially or highly erodible Too gravelly, cobbly, or stony	1.00 1.00 1.00 0.67	Very limited Potentially or highly erodible Bedrock Droughty Too gravelly, cobbly, or stony	1.00 1.00 0.97 0.67	Very limited Droughty Bedrock Potentially or highly erodible Too gravelly, cobbly, or stony Slope	1.00 1.00 1.00 0.67 0.12

Soil Survey of Young County, Texas

Table 13.--Grain and Seed Crops, Domestic Grasses and Legumes, and Irrigated Grain and Seed Crops for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover		Domestic grasses and legumes for food and cover		Irrigated grain and seed crops for food and cover	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GaB: Gageby-----	90	Somewhat limited Flooding	0.50	Somewhat limited Flooding	0.50	Somewhat limited Flooding	0.50
GdF: Goodnight-----	90	Very limited HEL wind	1.00	Very limited Potentially or highly erodible	1.00	Very limited HEL wind	1.00
		Potentially or highly erodible	1.00	Droughty	0.52	Potentially or highly erodible	1.00
		Droughty	1.00	Too sandy	0.50	Droughty	1.00
		Too sandy	0.50			Slope	1.00
GeA: Gowen-----	90	Somewhat limited Flooding	0.50	Somewhat limited Flooding	0.50	Somewhat limited Flooding	0.50
GfB: Grandfield-----	90	Very limited HEL wind	1.00	Somewhat limited Too sandy	0.50	Very limited HEL wind	1.00
		Too sandy	0.50			Droughty	0.32
		Droughty	0.32				
GnB: Grandfield-----	90	Somewhat limited Droughty	0.10	Not limited		Somewhat limited Droughty	0.10
GnC: Grandfield-----	90	Very limited Potentially or highly erodible	1.00	Very limited Potentially or highly erodible	1.00	Very limited Potentially or highly erodible	1.00
		Droughty	0.10			Droughty	0.10
GrB: Grandmore-----	85	Somewhat limited Droughty	0.16	Not limited		Somewhat limited Droughty	0.16
HeC: Heaton-----	85	Very limited HEL wind	1.00	Somewhat limited Too sandy	0.50	Very limited HEL wind	1.00
		Too sandy	1.00	Droughty	0.09	Droughty	1.00
		Droughty	1.00			Too sandy	0.50
HnB: Hensley-----	85	Very limited Droughty	1.00	Very limited Potentially or highly erodible	1.00	Very limited Droughty	1.00
		HEL wind	1.00	Bedrock	1.00	HEL wind	1.00
		Bedrock	1.00	Droughty	0.95	Bedrock	1.00
		Potentially or highly erodible	1.00	Percs slowly	0.33	Potentially or highly erodible	1.00
		Percs slowly	0.33			Percs slowly	0.33

Soil Survey of Young County, Texas

Table 13.--Grain and Seed Crops, Domestic Grasses and Legumes, and Irrigated Grain and Seed Crops for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover		Domestic grasses and legumes for food and cover		Irrigated grain and seed crops for food and cover	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HsB: Hensley-----	85	Very limited Droughty	1.00	Very limited Potentially or highly erodible	1.00	Very limited Droughty	1.00
		Bedrock	1.00	Bedrock	1.00	Bedrock	1.00
		Potentially or highly erodible	1.00	Too gravelly, cobbly, or stony	1.00	Potentially or highly erodible	1.00
		Too gravelly, cobbly, or stony	1.00	Droughty	0.95	Too gravelly, cobbly, or stony	1.00
		Percs slowly	0.33	Percs slowly	0.33	Percs slowly	0.33
JaB: Jacksboro-----	90	Very limited Droughty	1.00	Very limited Potentially or highly erodible	1.00	Very limited Droughty	1.00
		HEL wind	1.00	Bedrock	1.00	HEL wind	1.00
		Bedrock	1.00	Droughty	1.00	Bedrock	1.00
		Potentially or highly erodible	1.00			Potentially or highly erodible	1.00
JrE: Jolly-----	68	Very limited Droughty	1.00	Very limited Droughty	1.00	Very limited Droughty	1.00
		HEL wind	1.00	Potentially or highly erodible	1.00	HEL wind	1.00
		Bedrock	1.00	Bedrock	1.00	Bedrock	1.00
		Potentially or highly erodible	1.00			Potentially or highly erodible	1.00
						Slope	0.12
Rock outcrop-----	17	Not rated		Not rated		Not rated	
KaA: Kamay-----	85	Very limited Potentially or highly erodible	1.00	Very limited Potentially or highly erodible	1.00	Very limited Potentially or highly erodible	1.00
		Excess salt	0.50	Excess sodium	1.00	Excess salt	0.50
		Percs slowly	0.50	Excess salt	0.50	Percs slowly	0.50
		Droughty	0.32	Percs slowly	0.50	Droughty	0.32
		Excess Sodium	0.03			Excess Sodium	0.03
KvE: Knoco-----	54	Very limited Droughty	1.00	Very limited Potentially or highly erodible	1.00	Very limited Droughty	1.00
		Percs slowly	1.00	Percs slowly	1.00	Percs slowly	1.00
		Bedrock	1.00	Bedrock	1.00	Bedrock	1.00
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
		Potentially or highly erodible	1.00	Droughty	1.00	Potentially or highly erodible	1.00
Vernon-----	41	Very limited Percs slowly	1.00	Very limited Potentially or highly erodible	1.00	Very limited Percs slowly	1.00
		Too clayey	1.00	Percs slowly	1.00	Too clayey	1.00
		Potentially or highly erodible	1.00	Too clayey	1.00	Potentially or highly erodible	1.00
		Droughty	0.91	Bedrock	0.84	Droughty	0.91
		Bedrock	0.84	Excess sodium	0.08	Bedrock	0.84

Soil Survey of Young County, Texas

Table 13.--Grain and Seed Crops, Domestic Grasses and Legumes, and Irrigated Grain and Seed Crops for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover		Domestic grasses and legumes for food and cover		Irrigated grain and seed crops for food and cover	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KvG: Knoco-----	35	Very limited Droughty	1.00	Very limited Potentially or highly erodible	1.00	Very limited Droughty	1.00
		HEL wind	1.00	Percs slowly	1.00	Slope	1.00
		Percs slowly	1.00	Bedrock	1.00	HEL wind	1.00
		Bedrock	1.00	Too clayey	1.00	Percs slowly	1.00
		Too clayey	1.00	Droughty	1.00	Bedrock	1.00
Vernon-----	30	Very limited HEL wind	1.00	Very limited Potentially or highly erodible	1.00	Very limited HEL wind	1.00
		Percs slowly	1.00	Percs slowly	1.00	Percs slowly	1.00
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
		Potentially or highly erodible	1.00	Bedrock	0.99	Potentially or highly erodible	1.00
		Bedrock	0.99	Excess sodium	0.08	Slope	1.00
LeB: Leeray-----	85	Very limited Too clayey	1.00	Very limited Too clayey	1.00	Very limited Too clayey	1.00
		Percs slowly	0.50	Percs slowly	0.50	Percs slowly	0.50
LnA: Lincoln-----	90	Very limited Droughty	1.00	Somewhat limited Droughty	0.88	Very limited Droughty	1.00
		Flooding	0.50	Flooding	0.50	Flooding	0.50
LyB: Lindy-----	85	Very limited HEL wind	1.00	Very limited Potentially or highly erodible	1.00	Very limited HEL wind	1.00
		Potentially or highly erodible	1.00	Percs slowly	0.33	Potentially or highly erodible	1.00
		Droughty	0.57	Bedrock	0.29	Droughty	0.57
		Percs slowly	0.33			Percs slowly	0.33
		Bedrock	0.29			Bedrock	0.29
MwB: Minwells-----	85	Somewhat limited Percs slowly	0.33	Somewhat limited Percs slowly	0.33	Somewhat limited Percs slowly	0.33
		Droughty	0.12			Droughty	0.12
NcB: Newcastle-----	85	Very limited HEL wind	1.00	Somewhat limited Too sandy	0.50	Very limited HEL wind	1.00
		Droughty	0.98	Percs slowly	0.33	Droughty	0.98
		Too sandy	0.50	Bedrock	0.03	Percs slowly	0.33
		Percs slowly	0.33			Bedrock	0.03
		Bedrock	0.03				
NeB: Newcastle-----	88	Very limited HEL wind	1.00	Somewhat limited Bedrock	0.65	Very limited HEL wind	1.00
		Droughty	1.00	Percs slowly	0.33	Droughty	1.00
		Bedrock	0.65	Droughty	0.14	Bedrock	0.65
		Percs slowly	0.33			Percs slowly	0.33

Soil Survey of Young County, Texas

Table 13.--Grain and Seed Crops, Domestic Grasses and Legumes, and Irrigated Grain and Seed Crops for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover		Domestic grasses and legumes for food and cover		Irrigated grain and seed crops for food and cover	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NoC: Newcastle-----	45	Very limited HEL wind	1.00	Very limited Potentially or highly erodible	1.00	Very limited HEL wind	1.00
		Potentially or highly erodible	1.00	Percs slowly	0.33	Potentially or highly erodible	1.00
		Droughty	0.98	Bedrock	0.20	Droughty	0.98
		Percs slowly	0.33			Percs slowly	0.33
		Bedrock	0.20			Bedrock	0.20
Jolly-----	40	Very limited Droughty	1.00	Very limited Potentially or highly erodible	1.00	Very limited Droughty	1.00
		HEL wind	1.00	Bedrock	1.00	HEL wind	1.00
		Bedrock	1.00	Droughty	0.85	Bedrock	1.00
		Potentially or highly erodible	1.00			Potentially or highly erodible	1.00
NuA: Nukrum-----	85	Somewhat limited Too clayey	0.99	Somewhat limited Too clayey	0.99	Somewhat limited Too clayey	0.99
		Percs slowly	0.17	Percs slowly	0.17	Percs slowly	0.17
OhG: Owens-----	59	Very limited Percs slowly	1.00	Very limited Potentially or highly erodible	1.00	Very limited Slope	1.00
		Bedrock	1.00	Percs slowly	1.00	Percs slowly	1.00
		Too clayey	1.00	Bedrock	1.00	Bedrock	1.00
		Potentially or highly erodible	1.00	Too clayey	1.00	Too clayey	1.00
		Droughty	1.00	Droughty	0.40	Potentially or highly erodible	1.00
Harpersville-----	36	Very limited Droughty	1.00	Very limited Potentially or highly erodible	1.00	Very limited Droughty	1.00
		Percs slowly	1.00	Percs slowly	1.00	Slope	1.00
		Bedrock	1.00	Bedrock	1.00	Percs slowly	1.00
		Too clayey	1.00	Too clayey	1.00	Bedrock	1.00
		Potentially or highly erodible	1.00	Droughty	1.00	Too clayey	1.00
OnE: Owens-----	85	Very limited Droughty	1.00	Very limited Potentially or highly erodible	1.00	Very limited Droughty	1.00
		Percs slowly	1.00	Percs slowly	1.00	Percs slowly	1.00
		Bedrock	1.00	Bedrock	1.00	Bedrock	1.00
		Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
		Potentially or highly erodible	1.00	Droughty	0.62	Potentially or highly erodible	1.00
Ow: Oil-waste land-----	100	Not rated		Not rated		Not rated	

Soil Survey of Young County, Texas

Table 13.--Grain and Seed Crops, Domestic Grasses and Legumes, and Irrigated Grain and Seed Crops for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover		Domestic grasses and legumes for food and cover		Irrigated grain and seed crops for food and cover	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PaA: Padgett-----	90	Very limited Percs slowly Too clayey Flooding Droughty	1.00 1.00 0.50 0.14	Very limited Percs slowly Too clayey Flooding	1.00 1.00 0.50	Very limited Percs slowly Too clayey Flooding Droughty	1.00 1.00 0.50 0.14
PaD: Palopinto-----	85	Very limited Droughty Bedrock Too gravelly, cobbly, or stony	1.00 1.00 1.00	Very limited Droughty Bedrock Too gravelly, cobbly, or stony	1.00 1.00 1.00	Very limited Droughty Bedrock Too gravelly, cobbly, or stony	1.00 1.00 1.00
QU: Pits, quarry-----	100	Not rated		Not rated		Not rated	
RwB: Rowden-----	85	Very limited Potentially or highly erodible Too clayey Percs slowly Droughty Bedrock	1.00 0.81 0.33 0.22 0.10	Very limited Potentially or highly erodible Too clayey Percs slowly Bedrock	1.00 0.81 0.33 0.10	Very limited Potentially or highly erodible Too clayey Percs slowly Droughty Bedrock	1.00 0.81 0.33 0.22 0.10
SaA: Sagerton-----	85	Somewhat limited Droughty	0.66	Not limited		Somewhat limited Droughty	0.66
SaB: Sagerton-----	85	Somewhat limited Droughty	0.60	Not limited		Somewhat limited Droughty	0.60
ScB: Springcreek-----	85	Very limited Droughty HEL wind Potentially or highly erodible Bedrock	1.00 1.00 1.00 0.46	Very limited Potentially or highly erodible Droughty Bedrock	1.00 0.60 0.46	Very limited Droughty HEL wind Potentially or highly erodible Bedrock	1.00 1.00 1.00 0.46
SeB: Set-----	85	Very limited HEL wind Potentially or highly erodible Percs slowly	1.00 1.00 0.33	Very limited Potentially or highly erodible Percs slowly	1.00 0.33	Very limited HEL wind Potentially or highly erodible Percs slowly	1.00 1.00 0.33

Soil Survey of Young County, Texas

Table 13.--Grain and Seed Crops, Domestic Grasses and Legumes, and Irrigated Grain and Seed Crops for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover		Domestic grasses and legumes for food and cover		Irrigated grain and seed crops for food and cover	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SpG: Set-----	50	Very limited Potentially or highly erodible Slope	1.00 0.68	Very limited Potentially or highly erodible Slope	1.00 0.68	Very limited Slope	1.00
		Percs slowly Too gravelly, cobbly, or stony	0.33 0.01	Percs slowly Too gravelly, cobbly, or stony	0.33 0.01	Percs slowly Too gravelly, cobbly, or stony	0.33 0.01
Palopinto-----	40	Very limited Droughty Bedrock	1.00 1.00	Very limited Droughty Potentially or highly erodible Bedrock	1.00 1.00	Very limited Droughty Slope	1.00 1.00
		Potentially or highly erodible Too gravelly, cobbly, or stony	1.00 1.00	Potentially or highly erodible Too gravelly, cobbly, or stony	1.00 1.00	Bedrock	1.00
						Potentially or highly erodible Too gravelly, cobbly, or stony	1.00 1.00
StF: Shatruce-----	85	Very limited Percs slowly	1.00	Very limited Potentially or highly erodible Percs slowly	1.00	Very limited Slope	1.00
		Potentially or highly erodible Bedrock	1.00 0.80	Percs slowly Bedrock	1.00 0.80	Percs slowly	1.00
		Too gravelly, cobbly, or stony Droughty	0.76 0.64	Too gravelly, cobbly, or stony Slope	0.76 0.14	Potentially or highly erodible Bedrock	1.00 0.80
						Too gravelly, cobbly, or stony	0.76
StG: Shatruce-----	85	Very limited Percs slowly	1.00	Very limited Potentially or highly erodible Percs slowly	1.00	Very limited Slope	1.00
		Potentially or highly erodible Slope	1.00 0.78	Percs slowly Slope	1.00 0.78	Percs slowly	1.00
		Too gravelly, cobbly, or stony Bedrock	0.76 0.16	Too gravelly, cobbly, or stony Bedrock	0.76 0.16	Potentially or highly erodible Too gravelly, cobbly, or stony Bedrock	1.00 0.76 0.16
ThB: Thurber-----	85	Somewhat limited Droughty Percs slowly Too clayey	0.84 0.50 0.19	Somewhat limited Percs slowly Too clayey	0.50 0.19	Somewhat limited Droughty Percs slowly Too clayey	0.84 0.50 0.19
TkC: Throck-----	85	Very limited HEL wind	1.00	Very limited Potentially or highly erodible Too clayey	1.00	Very limited HEL wind	1.00
		Potentially or highly erodible Too clayey Percs slowly	1.00 0.70 0.33	Percs slowly	0.70 0.33	Potentially or highly erodible Too clayey Percs slowly	1.00 0.70 0.33

Soil Survey of Young County, Texas

Table 13.--Grain and Seed Crops, Domestic Grasses and Legumes, and Irrigated Grain and Seed Crops for Wildlife Habitat--Continued

Map symbol and soil name	Pct. of map unit	Grain and seed crops for food and cover		Domestic grasses and legumes for food and cover		Irrigated grain and seed crops for food and cover	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
TmB: Tillman-----	85	Somewhat limited Percs slowly Too clayey Droughty	0.33 0.19 0.01	Somewhat limited Percs slowly Too clayey	0.33 0.19	Somewhat limited Percs slowly Too clayey Droughty	0.33 0.19 0.01
TrB: Truce-----	85	Very limited HEL wind Potentially or highly erodible Droughty Percs slowly	1.00 1.00 0.94 0.33	Very limited Potentially or highly erodible Percs slowly	1.00 0.33	Very limited HEL wind Potentially or highly erodible Droughty Percs slowly	1.00 1.00 0.94 0.33
TrC: Truce-----	85	Very limited HEL wind Potentially or highly erodible Droughty Percs slowly	1.00 1.00 0.94 0.33	Very limited Potentially or highly erodible Percs slowly	1.00 0.33	Very limited HEL wind Potentially or highly erodible Droughty Percs slowly	1.00 1.00 0.94 0.33
VeC: Vernon-----	85	Very limited HEL wind Percs slowly Too clayey Potentially or highly erodible Droughty	1.00 1.00 1.00 1.00 0.98	Very limited Potentially or highly erodible Percs slowly Too clayey Bedrock Excess sodium	1.00 1.00 1.00 0.65 0.08	Very limited HEL wind Percs slowly Too clayey Potentially or highly erodible Droughty	1.00 1.00 1.00 1.00 0.98
W: Water-----	100	Not rated		Not rated		Not rated	
WaA: Westola-----	90	Somewhat limited Flooding Droughty	0.50 0.02	Somewhat limited Flooding	0.50	Somewhat limited Flooding Droughty	0.50 0.02
WdB: Weswind-----	85	Not limited		Not limited		Not limited	
WeA: Wheatwood-----	90	Somewhat limited Flooding	0.50	Somewhat limited Flooding	0.50	Somewhat limited Flooding	0.50
WhB: Wichita-----	90	Somewhat limited Too clayey	0.24	Somewhat limited Too clayey	0.24	Somewhat limited Too clayey	0.24
WtB: Winters-----	85	Not limited		Not limited		Not limited	

Soil Survey of Young County, Texas

Table 14.--Upland Native Herbaceous Plants, Uplands Shrubs and Vines

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants		Upland shrubs and vines	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AbA: Abilene-----	85	Not limited		Not limited	
AnB: Anocon-----	90	Not limited		Not limited	
BgB: Bluegrove-----	90	Not limited		Somewhat limited Bedrock	0.95
BoB: Bonti-----	85	Not limited		Somewhat limited Bedrock	0.71
BpC: Bastrop-----	90	Somewhat limited Sandy surface	0.40	Somewhat limited Sandy surface	0.40
BsB: Bastrop-----	85	Not limited		Not limited	
BsC2: Bastrop, eroded----	85	Not limited		Not limited	
CaC2: Callahan-----	90	Not limited		Somewhat limited Bedrock	0.95
ChB: Chaney-----	85	Somewhat limited Sandy surface	0.40	Very limited Bedrock Sandy surface	1.00 0.40
CkA: Clearfork-----	90	Not limited		Not limited	
DAM: Dams-----	100	Not rated		Not rated	
DeB: Decordova-----	90	Somewhat limited Sandy surface	0.40	Somewhat limited Sandy surface	0.40
DnB: Deandale-----	90	Somewhat limited Excess sodium	0.08	Not limited	
EnB: Enterprise-----	85	Not limited		Not limited	
EnC: Enterprise-----	85	Not limited		Not limited	

Soil Survey of Young County, Texas

Table 14.--Upland Native Herbaceous Plants, Uplands Shrubs and Vines--Continued

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants		Upland shrubs and vines	
		Rating class and limiting features	Value	Rating class and limiting features	Value
ExD: Exray-----	43	Somewhat limited Droughty	0.50	Somewhat limited Droughty Bedrock	0.50 0.10
Loving-----	33	Not limited		Somewhat limited Bedrock	0.24
GaB: Gageby-----	90	Not limited		Not limited	
GdF: Goodnight-----	90	Somewhat limited Sandy surface	0.40	Somewhat limited Sandy surface	0.40
GeA: Gowen-----	90	Not limited		Not limited	
GfB: Grandfield-----	90	Somewhat limited Sandy surface	0.40	Somewhat limited Sandy surface	0.40
GnB: Grandfield-----	90	Not limited		Not limited	
GnC: Grandfield-----	90	Not limited		Not limited	
GrB: Grandmore-----	85	Not limited		Not limited	
HeC: Heaton-----	85	Somewhat limited Sandy surface	0.60	Somewhat limited Sandy surface	0.60
HnB: Hensley-----	85	Not limited		Somewhat limited Bedrock	0.17
HsB: Hensley-----	85	Somewhat limited Too gravelly, cobble, or stony	0.02	Somewhat limited Bedrock Too gravelly, cobble, or stony	0.17 0.02
JaB: Jacksboro-----	90	Somewhat limited Droughty	0.50	Somewhat limited Droughty Bedrock	0.50 0.32
JrE: Jolly-----	68	Somewhat limited Droughty	0.50	Somewhat limited Droughty Bedrock	0.50 0.10
Rock outcrop-----	17	Not rated		Not rated	

Soil Survey of Young County, Texas

Table 14.--Upland Native Herbaceous Plants, Uplands Shrubs and Vines--Continued

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants		Upland shrubs and vines	
		Rating class and limiting features	Value	Rating class and limiting features	Value
KaA: Kamay-----	85	Very limited Excess sodium Excess salt	1.00 0.06	Somewhat limited Excess salt Excess Sodium	0.06 0.03
KvE: Knoco-----	54	Somewhat limited Too clayey Droughty	0.50 0.50	Somewhat limited Too clayey Droughty Bedrock	0.50 0.50 0.01
Vernon-----	41	Somewhat limited Too clayey Excess sodium	0.50 0.08	Somewhat limited Bedrock Too clayey	0.68 0.50
KvG: Knoco-----	35	Somewhat limited Too clayey Droughty	0.50 0.50	Somewhat limited Too clayey Droughty Bedrock	0.50 0.50 0.04
Vernon-----	30	Somewhat limited Too clayey Excess sodium	0.50 0.08	Somewhat limited Too clayey Bedrock	0.50 0.42
LeB: Leeray-----	85	Somewhat limited Too clayey	0.50	Somewhat limited Too clayey	0.50
LnA: Lincoln-----	90	Not limited		Not limited	
LyB: Lindy-----	85	Not limited		Somewhat limited Bedrock	0.91
MwB: Minwells-----	85	Not limited		Not limited	
NcB: Newcastle-----	85	Somewhat limited Sandy surface	0.40	Somewhat limited Bedrock Sandy surface	0.99 0.40
NeB: Newcastle-----	88	Not limited		Somewhat limited Bedrock	0.79
NoC: Newcastle-----	45	Not limited		Somewhat limited Bedrock	0.94
Jolly-----	40	Not limited		Somewhat limited Bedrock	0.36

Soil Survey of Young County, Texas

Table 14.--Upland Native Herbaceous Plants, Uplands Shrubs and Vines--Continued

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants		Upland shrubs and vines	
		Rating class and limiting features	Value	Rating class and limiting features	Value
NuA: Nukrum-----	85	Not limited		Not limited	
OhG: Owens-----	59	Somewhat limited Too clayey	0.50	Somewhat limited Too clayey Bedrock	0.50 0.36
Harpersville-----	36	Somewhat limited Too clayey Droughty	0.50 0.50	Somewhat limited Too clayey Droughty Bedrock	0.50 0.50 0.02
OnE: Owens-----	85	Somewhat limited Too clayey	0.50	Somewhat limited Too clayey Bedrock	0.50 0.27
Ow: Oil-waste land-----	100	Not rated		Not rated	
PaA: Padgett-----	90	Somewhat limited Too clayey	0.50	Somewhat limited Too clayey	0.50
PaD: Palopinto-----	85	Somewhat limited Droughty Too gravelly, cobbly, or stony	0.50 0.01	Somewhat limited Droughty Bedrock Too gravelly, cobbly, or stony	0.50 0.08 0.01
QU: Pits, quarry-----	100	Not rated		Not rated	
RwB: Rowden-----	85	Not limited		Somewhat limited Bedrock	0.97
SaA: Sagerton-----	85	Not limited		Not limited	
SaB: Sagerton-----	85	Not limited		Not limited	
ScB: Springcreek-----	85	Not limited		Somewhat limited Bedrock	0.86
SeB: Set-----	85	Not limited		Very limited Bedrock	1.00

Soil Survey of Young County, Texas

Table 14.--Upland Native Herbaceous Plants, Uplands Shrubs and Vines--Continued

Map symbol and soil name	Pct. of map unit	Upland native herbaceous plants		Upland shrubs and vines	
		Rating class and limiting features	Value	Rating class and limiting features	Value
SpG: Set-----	50	Not limited		Very limited Bedrock	1.00
Palopinto-----	40	Somewhat limited Droughty Too gravelly, cobbly, or stony	0.50 0.01	Somewhat limited Droughty Bedrock Too gravelly, cobbly, or stony	0.50 0.13 0.01
StF: Shatruce-----	85	Not limited		Somewhat limited Bedrock	0.71
StG: Shatruce-----	85	Not limited		Somewhat limited Bedrock	0.95
ThB: Thurber-----	85	Not limited		Not limited	
TkC: Throck-----	85	Not limited		Very limited Bedrock	1.00
TmB: Tillman-----	85	Not limited		Not limited	
TrB: Truce-----	85	Not limited		Very limited Bedrock	1.00
TrC: Truce-----	85	Not limited		Very limited Bedrock	1.00
VeC: Vernon-----	85	Somewhat limited Too clayey Excess sodium	0.50 0.08	Somewhat limited Bedrock Too clayey	0.79 0.50
W: Water-----	100	Not rated		Not rated	
WaA: Westola-----	90	Not limited		Not limited	
WdB: Weswind-----	85	Not limited		Not limited	
WeA: Wheatwood-----	90	Not limited		Not limited	
WhB: Wichita-----	90	Not limited		Not limited	
WtB: Winters-----	85	Not limited		Not limited	

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Table 15.--Upland Deciduous Trees, Upland Mixed Deciduous, and Coniferous Trees

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Upland deciduous trees		Upland mixed deciduous and coniferous trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AbA: Abilene-----	85	Somewhat limited Too arid	0.50	Somewhat limited Too arid	0.50
AnB: Anocon-----	90	Somewhat limited Too arid	0.50	Somewhat limited Too arid Droughty	0.50 0.04
BgB: Bluegrove-----	90	Somewhat limited Too arid Bedrock	0.50 0.16	Somewhat limited Too arid Bedrock Droughty	0.50 0.16 0.01
BoB: Bonti-----	85	Somewhat limited Bedrock Too arid Droughty	0.80 0.50 0.02	Somewhat limited Droughty Bedrock Too arid	0.86 0.80 0.50
BpC: Bastrop-----	90	Somewhat limited Too arid	0.50	Somewhat limited Too arid Droughty	0.50 0.04
BsB: Bastrop-----	85	Somewhat limited Too arid	0.50	Somewhat limited Too arid	0.50
BsC2: Bastrop, eroded----	85	Somewhat limited Too arid	0.50	Somewhat limited Too arid	0.50
CaC2: Callahan-----	90	Somewhat limited Too arid Bedrock	0.50 0.16	Somewhat limited Too arid Bedrock Droughty	0.50 0.16 0.02
ChB: Chaney-----	85	Somewhat limited Too arid	0.50	Somewhat limited Too arid Droughty	0.50 0.28
CkA: Clearfork-----	90	Somewhat limited Too arid	0.50	Somewhat limited Too arid Droughty	0.50 0.32
DAM: Dams-----	100	Not rated		Not rated	

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Table 15.--Upland Deciduous Trees, Upland Mixed Deciduous and Coniferous Trees--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees		Upland mixed deciduous and coniferous trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value
DeB: Decordova-----	90	Somewhat limited Too arid	0.50	Somewhat limited Too arid Droughty	0.50 0.42
DnB: Deandale-----	90	Somewhat limited Too arid	0.50	Somewhat limited Too arid	0.50
EnB: Enterprise-----	85	Somewhat limited Too arid	0.50	Somewhat limited Too arid	0.50
EnC: Enterprise-----	85	Somewhat limited Too arid	0.50	Somewhat limited Too arid	0.50
ExD: Exray-----	43	Very limited Droughty Bedrock Too arid	1.00 1.00 0.50	Very limited Bedrock Droughty Too arid	1.00 1.00 0.50
Loving-----	33	Very limited Bedrock Droughty Too arid	1.00 0.97 0.50	Very limited Bedrock Droughty Too arid	1.00 1.00 0.50
GaB: Gageby-----	90	Somewhat limited Too arid	0.50	Somewhat limited Too arid	0.50
GdF: Goodnight-----	90	Somewhat limited Droughty Too arid	0.52 0.50	Very limited Droughty Too arid	1.00 0.50
GeA: Gowen-----	90	Somewhat limited Too arid	0.50	Somewhat limited Too arid	0.50
GfB: Grandfield-----	90	Somewhat limited Too arid	0.50	Somewhat limited Too arid Droughty	0.50 0.14
GnB: Grandfield-----	90	Somewhat limited Too arid	0.50	Somewhat limited Too arid Droughty	0.50 0.05
GnC: Grandfield-----	90	Somewhat limited Too arid	0.50	Somewhat limited Too arid Droughty	0.50 0.05

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Table 15.--Upland Deciduous Trees, Upland Mixed Deciduous and Coniferous Trees--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees		Upland mixed deciduous and coniferous trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value
GrB: Grandmore-----	85	Somewhat limited Too arid	0.50	Somewhat limited Too arid Droughty	0.50 0.07
HeC: Heaton-----	85	Somewhat limited Too arid Droughty	0.50 0.09	Somewhat limited Droughty Too arid	0.93 0.50
HnB: Hensley-----	85	Very limited Bedrock Droughty Too arid	1.00 0.95 0.50	Very limited Bedrock Droughty Too arid	1.00 1.00 0.50
HsB: Hensley-----	85	Very limited Bedrock Droughty Too arid	1.00 0.95 0.50	Very limited Bedrock Droughty Too arid	1.00 1.00 0.50
JaB: Jacksboro-----	90	Very limited Bedrock Droughty Too arid	1.00 1.00 0.50	Very limited Bedrock Droughty Too arid	1.00 1.00 0.50
JrE: Jolly-----	68	Very limited Droughty Bedrock Too arid	1.00 1.00 0.50	Very limited Bedrock Droughty Too arid	1.00 1.00 0.50
Rock outcrop-----	17	Not rated		Not rated	
KaA: Kamay-----	85	Somewhat limited Too arid	0.50	Somewhat limited Too arid Droughty	0.50 0.14
KvE: Knoco-----	54	Very limited Bedrock Too arid Droughty	1.00 1.00 1.00	Very limited Bedrock Too arid Droughty	1.00 1.00 1.00
Vernon-----	41	Somewhat limited Bedrock Too arid	0.84 0.50	Somewhat limited Bedrock Droughty Too arid	0.84 0.55 0.50

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Table 15.--Upland Deciduous Trees, Upland Mixed Deciduous and Coniferous Trees--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees		Upland mixed deciduous and coniferous trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value
KvG: Knoco-----	35	Very limited Bedrock Too arid Droughty	1.00 1.00 1.00	Very limited Bedrock Too arid Droughty	1.00 1.00 1.00
Vernon-----	30	Somewhat limited Bedrock Too arid	0.99 0.50	Somewhat limited Bedrock Droughty Too arid	0.99 0.70 0.50
LeB: Leeray-----	85	Somewhat limited Too arid	0.50	Somewhat limited Too arid	0.50
LnA: Lincoln-----	90	Somewhat limited Droughty Too arid	0.88 0.50	Very limited Growing season wetness Droughty Too arid	1.00 1.00 0.50
LyB: Lindy-----	85	Somewhat limited Too arid Bedrock	0.50 0.29	Somewhat limited Too arid Bedrock Droughty	0.50 0.29 0.25
MwB: Minwells-----	85	Somewhat limited Too arid	0.50	Somewhat limited Too arid Droughty	0.50 0.05
NcB: Newcastle-----	85	Somewhat limited Too arid Bedrock	0.50 0.03	Somewhat limited Droughty Too arid Bedrock	0.69 0.50 0.03
NeB: Newcastle-----	88	Somewhat limited Bedrock Too arid Droughty	0.65 0.50 0.14	Somewhat limited Droughty Bedrock Too arid	0.95 0.65 0.50
NoC: Newcastle-----	45	Somewhat limited Too arid Bedrock	0.50 0.20	Somewhat limited Droughty Too arid Bedrock	0.68 0.50 0.20
Jolly-----	40	Very limited Bedrock Droughty Too arid	1.00 0.85 0.50	Very limited Bedrock Droughty Too arid	1.00 1.00 0.50
NuA: Nukrum-----	85	Somewhat limited Too arid	0.50	Somewhat limited Too arid	0.50

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Table 15.--Upland Deciduous Trees, Upland Mixed Deciduous and Coniferous Trees--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees		Upland mixed deciduous and coniferous trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value
OhG: Owens-----	59	Very limited Bedrock Too arid Droughty	1.00 0.50 0.40	Very limited Bedrock Droughty Too arid	1.00 0.99 0.50
Harpersville-----	36	Very limited Bedrock Too arid Droughty	1.00 1.00 1.00	Very limited Bedrock Too arid Droughty	1.00 1.00 1.00
OnE: Owens-----	85	Very limited Bedrock Droughty Too arid	1.00 0.62 0.50	Very limited Bedrock Droughty Too arid	1.00 1.00 0.50
Ow: Oil-waste land-----	100	Not rated		Not rated	
PaA: Padgett-----	90	Somewhat limited Too arid	0.50	Somewhat limited Too arid Droughty	0.50 0.06
PaD: Palopinto-----	85	Very limited Droughty Bedrock Too arid	1.00 1.00 0.50	Very limited Bedrock Droughty Too arid	1.00 1.00 0.50
QU: Pits, quarry-----	100	Not rated		Not rated	
RwB: Rowden-----	85	Somewhat limited Too arid Bedrock	0.50 0.10	Somewhat limited Too arid Bedrock Droughty	0.50 0.10 0.10
SaA: Sagerton-----	85	Somewhat limited Too arid	0.50	Somewhat limited Too arid Droughty	0.50 0.31
SaB: Sagerton-----	85	Somewhat limited Too arid	0.50	Somewhat limited Too arid Droughty	0.50 0.27
ScB: Springcreek-----	85	Somewhat limited Droughty Too arid Bedrock	0.60 0.50 0.46	Very limited Droughty Too arid Bedrock	1.00 0.50 0.46

Soil Survey of Young County, Texas

Table 15.--Upland Deciduous Trees, Upland Mixed Deciduous and Coniferous Trees--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees		Upland mixed deciduous and coniferous trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value
SeB: Set-----	85	Somewhat limited Too arid	0.50	Somewhat limited Too arid	0.50
SpG: Set-----	50	Somewhat limited Too arid	0.50	Somewhat limited Too arid	0.50
Palopinto-----	40	Very limited		Very limited	
		Droughty	1.00	Bedrock	1.00
		Bedrock	1.00	Droughty	1.00
		Too arid	0.50	Too arid	0.50
StF: Shatruce-----	85	Somewhat limited Bedrock Too arid	0.80 0.50	Somewhat limited Bedrock Too arid Droughty	0.80 0.50 0.29
StG: Shatruce-----	85	Somewhat limited Too arid Bedrock	0.50 0.16	Somewhat limited Too arid Bedrock Droughty	0.50 0.16 0.06
ThB: Thurber-----	85	Somewhat limited Too arid	0.50	Somewhat limited Too arid Droughty	0.50 0.46
TkC: Throck-----	85	Somewhat limited Too arid	0.50	Somewhat limited Too arid	0.50
TmB: Tillman-----	85	Somewhat limited Too arid	0.50	Somewhat limited Too arid Droughty	0.50 0.01
TrB: Truce-----	85	Somewhat limited Too arid	0.50	Somewhat limited Droughty Too arid	0.60 0.50
TrC: Truce-----	85	Somewhat limited Too arid	0.50	Somewhat limited Droughty Too arid	0.59 0.50
VeC: Vernon-----	85	Somewhat limited Bedrock Too arid	0.65 0.50	Somewhat limited Droughty Bedrock Too arid	0.67 0.65 0.50
W: Water-----	100	Not rated		Not rated	

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Table 15.--Upland Deciduous Trees, Upland Mixed Deciduous and Coniferous Trees--Continued

Map symbol and soil name	Pct. of map unit	Upland deciduous trees		Upland mixed deciduous and coniferous trees	
		Rating class and limiting features	Value	Rating class and limiting features	Value
WaA: Westola-----	90	Somewhat limited Too arid	0.50	Somewhat limited Too arid Droughty	0.50 0.01
WdB: Weswind-----	85	Somewhat limited Too arid	0.50	Somewhat limited Too arid	0.50
WeA: Wheatwood-----	90	Somewhat limited Too arid	0.50	Somewhat limited Too arid	0.50
WhB: Wichita-----	90	Somewhat limited Too arid	0.50	Somewhat limited Too arid	0.50
WtB: Winters-----	85	Somewhat limited Too arid	0.50	Somewhat limited Too arid	0.50

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Table 16.--Riparian Herbaceous Plants, Shrubs, Vines, and Trees, and Freshwater Wetland Plants

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Riparian herbaceous plants		Riparian shrubs, vines, and trees		Freshwater wetland plants	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AbA: Abilene-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
AnB: Anocon-----	90	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
BgB: Bluegrove-----	90	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
BoB: Bonti-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry Droughty	1.00 0.02	Very limited Too dry Too acid	1.00 0.14
BpC: Bastrop-----	90	Very limited Too dry Infrequent flooding Too sandy	1.00 1.00 0.50	Very limited Too dry	1.00	Very limited Too dry	1.00
BsB: Bastrop-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
BsC2: Bastrop, eroded-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
CaC2: Callahan-----	90	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00

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Table 16.--Riparian Herbaceous Plants, Shrubs, Vines, and Trees, and Freshwater Wetland Plants--Continued

Map symbol and soil name	Pct. of map unit	Riparian herbaceous plants		Riparian shrubs, vines, and trees		Freshwater wetland plants	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ChB: Chaney-----	85	Very limited Too dry Infrequent flooding Too sandy	1.00 1.00 0.50	Very limited Too dry	1.00	Very limited Too dry	1.00
CkA: Clearfork-----	90	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
DAM: Dams-----	100	Not rated		Not rated		Not rated	
DeB: Decordova-----	90	Very limited Too dry Infrequent flooding Too sandy	1.00 1.00 0.50	Very limited Too dry	1.00	Very limited Too dry	1.00
DnB: Deandale-----	90	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry Excess salt	1.00 0.01
EnB: Enterprise-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
EnC: Enterprise-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
ExD: Exray-----	43	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry Droughty	1.00 1.00	Very limited Too dry	1.00
Loving-----	33	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry Droughty	1.00 0.97	Very limited Too dry	1.00
GaB: Gageby-----	90	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00

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Table 16.--Riparian Herbaceous Plants, Shrubs, Vines, and Trees, and Freshwater Wetland Plants--Continued

Map symbol and soil name	Pct. of map unit	Riparian herbaceous plants		Riparian shrubs, vines, and trees		Freshwater wetland plants	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GdF: Goodnight-----	90	Very limited Too dry Infrequent flooding Too sandy	1.00 1.00 0.50	Very limited Too dry Droughty	1.00 0.52	Very limited Too dry	1.00
GeA: Gowen-----	90	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
GfB: Grandfield-----	90	Very limited Too dry Infrequent flooding Too sandy	1.00 1.00 0.50	Very limited Too dry	1.00	Very limited Too dry	1.00
GnB: Grandfield-----	90	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
GnC: Grandfield-----	90	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
GrB: Grandmore-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
HeC: Heaton-----	85	Very limited Too sandy Too dry Infrequent flooding	1.00 1.00 1.00	Very limited Too dry Droughty	1.00 0.09	Very limited Too dry Too sandy	1.00 0.50
HnB: Hensley-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry Droughty	1.00 0.95	Very limited Too dry	1.00
HsB: Hensley-----	85	Very limited Too dry Infrequent flooding Too gravelly, cobbly, or stony	1.00 1.00 0.06	Very limited Too dry Droughty	1.00 0.95	Very limited Too dry	1.00

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Table 16.--Riparian Herbaceous Plants, Shrubs, Vines, and Trees, and Freshwater Wetland Plants--Continued

Map symbol and soil name	Pct. of map unit	Riparian herbaceous plants		Riparian shrubs, vines, and trees		Freshwater wetland plants	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
JaB: Jacksboro-----	90	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry Droughty	1.00 1.00	Very limited Too dry Too acid	1.00 0.04
JrE: Jolly-----	68	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry Droughty	1.00 1.00	Very limited Too dry	1.00
Rock outcrop-----	17	Not rated		Not rated		Not rated	
KaA: Kamay-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
KvE: Knoco-----	54	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry Droughty	1.00 1.00	Very limited Too dry Excess salt	1.00 0.16
Vernon-----	41	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
KvG: Knoco-----	35	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry Droughty	1.00 1.00	Very limited Too dry Excess salt	1.00 0.16
Vernon-----	30	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
LeB: Leeray-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
LnA: Lincoln-----	90	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry Droughty	1.00 0.88	Very limited Too dry	1.00

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Table 16.--Riparian Herbaceous Plants, Shrubs, Vines, and Trees, and Freshwater Wetland Plants--Continued

Map symbol and soil name	Pct. of map unit	Riparian herbaceous plants		Riparian shrubs, vines, and trees		Freshwater wetland plants	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LyB: Lindy-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
MwB: Minwells-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
NcB: Newcastle-----	85	Very limited Too dry Infrequent flooding Too sandy	1.00 1.00 0.50	Very limited Too dry	1.00	Very limited Too dry Too acid	1.00 0.04
NeB: Newcastle-----	88	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry Droughty	1.00 0.14	Very limited Too dry	1.00
NoC: Newcastle-----	45	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
Jolly-----	40	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry Droughty	1.00 0.85	Very limited Too dry	1.00
NuA: Nukrum-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
OhG: Owens-----	59	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry Droughty	1.00 0.40	Very limited Too dry	1.00
Harpersville-----	36	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry Droughty	1.00 1.00	Very limited Too dry	1.00
OnE: Owens-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry Droughty	1.00 0.62	Very limited Too dry	1.00

Soil Survey of Young County, Texas

Table 16.--Riparian Herbaceous Plants, Shrubs, Vines, and Trees, and Freshwater Wetland Plants--Continued

Map symbol and soil name	Pct. of map unit	Riparian herbaceous plants		Riparian shrubs, vines, and trees		Freshwater wetland plants	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ow: Oil-waste land-----	100	Not rated		Not rated		Not rated	
PaA: Padgett-----	90	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
PaD: Palopinto-----	85	Very limited Too dry Infrequent flooding Too gravelly, cobbly, or stony	1.00 1.00 0.03	Very limited Too dry Droughty	1.00 1.00	Very limited Too dry	1.00
QU: Pits, quarry-----	100	Not rated		Not rated		Not rated	
RwB: Rowden-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
SaA: Sagerton-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
SaB: Sagerton-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
ScB: Springcreek-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry Droughty	1.00 0.60	Very limited Too dry	1.00
SeB: Set-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00

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Table 16.--Riparian Herbaceous Plants, Shrubs, Vines, and Trees, and Freshwater Wetland Plants--Continued

Map symbol and soil name	Pct. of map unit	Riparian herbaceous plants		Riparian shrubs, vines, and trees		Freshwater wetland plants	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SpG: Set-----	50	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
Palopinto-----	40	Very limited Too dry Infrequent flooding Too gravelly, cobbly, or stony	1.00 1.00 0.03	Very limited Too dry Droughty	1.00 1.00	Very limited Too dry	1.00
StF: Shatruce-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry Too acid	1.00 0.22
StG: Shatruce-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry Too acid	1.00 0.22
ThB: Thurber-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
TkC: Throck-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
TmB: Tillman-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
TrB: Truce-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
TrC: Truce-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
VeC: Vernon-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00

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Table 16.--Riparian Herbaceous Plants, Shrubs, Vines, and Trees, and Freshwater Wetland Plants--Continued

Map symbol and soil name	Pct. of map unit	Riparian herbaceous plants		Riparian shrubs, vines, and trees		Freshwater wetland plants	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
W: Water-----	100	Not rated		Not rated		Not rated	
WaA: Westola-----	90	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
WdB: Weswind-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
WeA: Wheatwood-----	90	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
WhB: Wichita-----	90	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00
WtB: Winters-----	85	Very limited Too dry Infrequent flooding	1.00 1.00	Very limited Too dry	1.00	Very limited Too dry	1.00

Soil Survey of Young County, Texas

Table 17.--Dwellings and Small Commercial Buildings

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AbA: Abilene-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
AnB: Anocon-----	90	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
BgB: Bluegrove-----	90	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to soft bedrock	0.50 0.15	Somewhat limited Shrink-swell	0.50
BoB: Bonti-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to soft bedrock Shrink-swell	0.79 0.50	Somewhat limited Shrink-swell	0.50
BpC: Bastrop-----	90	Not limited		Not limited		Not limited	
BsB: Bastrop-----	85	Not limited		Not limited		Not limited	
BsC2: Bastrop, eroded----	85	Not limited		Not limited		Not limited	
CaC2: Callahan-----	90	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to soft bedrock	0.50 0.15	Somewhat limited Shrink-swell	0.50
ChB: Chaney-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
CkA: Clearfork-----	90	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50
DAM: Dams-----	100	Not rated		Not rated		Not rated	
DeB: Decordova-----	90	Not limited		Not limited		Not limited	
DnB: Deandale-----	90	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00

Soil Survey of Young County, Texas

Table 17.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EnB: Enterprise-----	85	Not limited		Not limited		Not limited	
EnC: Enterprise-----	85	Not limited		Not limited		Not limited	
ExD: Exray-----	43	Somewhat limited Shrink-swell	0.50	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock	1.00
		Depth to soft bedrock	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
Loving-----	33	Somewhat limited Depth to soft bedrock	0.50	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock	1.00
						Slope	0.12
GaB: Gageby-----	90	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
GdF: Goodnight-----	90	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00
GeA: Gowen-----	90	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
GfB: Grandfield-----	90	Not limited		Not limited		Not limited	
GnB: Grandfield-----	90	Not limited		Not limited		Not limited	
GnC: Grandfield-----	90	Not limited		Not limited		Not limited	
GrB: Grandmore-----	85	Not limited		Somewhat limited Shrink-swell	0.50	Not limited	
HeC: Heaton-----	85	Not limited		Not limited		Not limited	
HnB: Hensley-----	85	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

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Table 17.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HsB: Hensley-----	85	Very limited Depth to hard bedrock Shrink-swell	1.00 0.50	Very limited Depth to hard bedrock Shrink-swell	1.00 0.50	Very limited Depth to hard bedrock Shrink-swell	1.00 0.50
JaB: Jacksboro-----	90	Very limited Depth to hard bedrock Shrink-swell	1.00 0.50	Very limited Depth to hard bedrock Shrink-swell	1.00 0.50	Very limited Depth to hard bedrock Shrink-swell	1.00 0.50
JrE: Jolly-----	68	Somewhat limited Depth to soft bedrock	0.50	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock Slope	1.00 0.12
Rock outcrop-----	17	Not rated		Not rated		Not rated	
KaA: Kamay-----	85	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
KvE: Knoco-----	54	Somewhat limited Depth to soft bedrock	0.50	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock Slope	1.00 0.88
Vernon-----	41	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to soft bedrock	1.00 0.84	Very limited Shrink-swell Slope	1.00 0.12
KvG: Knoco-----	35	Very limited Too steep Depth to soft bedrock	1.00 0.50	Very limited Depth to soft bedrock Too steep	1.00 1.00	Very limited Slope Depth to soft bedrock	1.00 1.00
Vernon-----	30	Very limited Shrink-swell Slope	1.00 0.01	Very limited Shrink-swell Depth to soft bedrock Slope	1.00 0.99 0.01	Very limited Shrink-swell Slope	1.00 1.00
LeB: Leeray-----	85	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
LnA: Lincoln-----	90	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00

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Table 17.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LyB: Lindy-----	85	Somewhat limited Shrink-swell	0.50	Very limited Depth to hard bedrock	1.00	Somewhat limited Shrink-swell	0.50
		Depth to hard bedrock	0.29	Shrink-swell	0.50	Depth to hard bedrock	0.29
MwB: Minwells-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
NcB: Newcastle-----	85	Not limited		Somewhat limited Depth to soft bedrock	0.03	Not limited	
NeB: Newcastle-----	88	Not limited		Somewhat limited Depth to soft bedrock	0.64	Not limited	
NoC: Newcastle-----	45	Not limited		Somewhat limited Depth to soft bedrock	0.20	Not limited	
Jolly-----	40	Somewhat limited Depth to soft bedrock	0.50	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock	1.00
NuA: Nukrum-----	85	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
OhG: Owens-----	59	Very limited Too steep	1.00	Very limited Depth to soft bedrock	1.00	Very limited Slope	1.00
		Shrink-swell	0.96	Too steep	1.00	Depth to soft bedrock	1.00
		Depth to soft bedrock	0.50	Shrink-swell	0.96	Shrink-swell	0.96
Harpersville-----	36	Very limited Too steep	1.00	Very limited Depth to soft bedrock	1.00	Very limited Slope	1.00
		Shrink-swell	0.96	Too steep	1.00	Depth to soft bedrock	1.00
		Depth to soft bedrock	0.50	Shrink-swell	0.96	Shrink-swell	0.96
OnE: Owens-----	85	Somewhat limited Shrink-swell	0.96	Very limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00
		Depth to soft bedrock	0.50	Shrink-swell	0.96	Slope	1.00
		Slope	0.04	Slope	0.04	Shrink-swell	0.96

Soil Survey of Young County, Texas

Table 17.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ow: Oil-waste land-----	100	Not rated		Not rated		Not rated	
PaA: Padgett-----	90	Very limited Flooding Shrink-swell	1.00 1.00	Very limited Flooding Shrink-swell	1.00 1.00	Very limited Flooding Shrink-swell	1.00 1.00
PaD: Palopinto-----	85	Very limited Depth to hard bedrock Large stones Shrink-swell	1.00 1.00 0.02	Very limited Depth to hard bedrock Large stones Shrink-swell	1.00 1.00 0.02	Very limited Depth to hard bedrock Large stones Shrink-swell	1.00 1.00 0.02
QU: Pits, quarry-----	100	Not rated		Not rated		Not rated	
RwB: Rowden-----	85	Very limited Shrink-swell Depth to hard bedrock	1.00 0.10	Very limited Shrink-swell Depth to hard bedrock	1.00 1.00	Very limited Shrink-swell Depth to hard bedrock	1.00 0.10
SaA: Sagerton-----	85	Somewhat limited Shrink-swell	0.94	Somewhat limited Shrink-swell	0.22	Somewhat limited Shrink-swell	0.94
SaB: Sagerton-----	85	Somewhat limited Shrink-swell	0.94	Somewhat limited Shrink-swell	0.94	Somewhat limited Shrink-swell	0.94
ScB: Springcreek-----	85	Somewhat limited Depth to hard bedrock	0.46	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to hard bedrock	0.46
SeB: Set-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
SpG: Set-----	50	Very limited Too steep Shrink-swell	1.00 0.50	Very limited Too steep Shrink-swell	1.00 0.50	Very limited Slope Shrink-swell	1.00 0.50
Palopinto-----	40	Very limited Depth to hard bedrock Large stones Slope Shrink-swell	1.00 1.00 0.96 0.02	Very limited Depth to hard bedrock Large stones Slope Shrink-swell	1.00 1.00 0.96 0.02	Very limited Slope Depth to hard bedrock Large stones Shrink-swell	1.00 1.00 1.00 0.02

Soil Survey of Young County, Texas

Table 17.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
StF: Shatruce-----	85	Very limited Too steep Shrink-swell	1.00 0.50	Very limited Too steep Depth to soft bedrock Shrink-swell	1.00 0.79 0.50	Very limited Slope Shrink-swell	1.00 0.50
StG: Shatruce-----	85	Very limited Too steep Shrink-swell	1.00 0.50	Very limited Too steep Shrink-swell Depth to soft bedrock	1.00 0.50 0.15	Very limited Slope Shrink-swell	1.00 0.50
ThB: Thurber-----	85	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
TkC: Throck-----	85	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
TmB: Tillman-----	85	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
TrB: Truce-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
TrC: Truce-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
VeC: Vernon-----	85	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to soft bedrock	1.00 0.64	Very limited Shrink-swell	1.00
W: Water-----	100	Not rated		Not rated		Not rated	
WaA: Westola-----	90	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
WdB: Weswind-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
WeA: Wheatwood-----	90	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
WhB: Wichita-----	90	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50

Soil Survey of Young County, Texas

Table 17.--Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WtB: Winters-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50

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Table 18.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AbA: Abilene-----	85	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
AnB: Anocon-----	90	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave Too clayey	0.10 0.03	Not limited	
BgB: Bluegrove-----	90	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Depth to soft bedrock Too clayey Cutbanks cave	0.15 0.12 0.10	Somewhat limited Depth to bedrock	0.16
BoB: Bonti-----	85	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Depth to soft bedrock Too clayey Cutbanks cave	0.79 0.15 0.10	Somewhat limited Depth to bedrock Droughty	0.80 0.03
BpC: Bastrop-----	90	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
BsB: Bastrop-----	85	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
BsC2: Bastrop, eroded----	85	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
CaC2: Callahan-----	90	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Depth to soft bedrock Too clayey Cutbanks cave	0.15 0.12 0.10	Somewhat limited Depth to bedrock	0.16
ChB: Chaney-----	85	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Dense layer Cutbanks cave Too clayey	0.50 0.10 0.03	Very limited Too dense	1.00

Soil Survey of Young County, Texas

Table 18.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CkA: Clearfork-----	90	Very limited Flooding Low strength Shrink-swell	1.00 1.00 0.50	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60
DAM: Dams-----	100	Not rated		Not rated		Not rated	
DeB: Decordova-----	90	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
DnB: Deandale-----	90	Very limited Low strength Shrink-swell	1.00 1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
EnB: Enterprise-----	85	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
EnC: Enterprise-----	85	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
ExD: Exray-----	43	Very limited Depth to soft bedrock Low strength Shrink-swell	1.00 1.00 0.50	Very limited Depth to soft bedrock Cutbanks cave	1.00 0.10	Very limited Droughty Depth to bedrock Large stones	1.00 1.00 0.88
Loving-----	33	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Dense layer Cutbanks cave	1.00 0.50 0.10	Very limited Depth to bedrock Large stones Droughty	1.00 1.00 0.97
GaB: Gageby-----	90	Very limited Flooding Low strength Shrink-swell	1.00 1.00 0.50	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60
GdF: Goodnight-----	90	Somewhat limited Slope	0.16	Very limited Cutbanks cave Slope	1.00 0.16	Somewhat limited Droughty Slope	0.53 0.16
GeA: Gowen-----	90	Very limited Flooding Low strength Shrink-swell	1.00 1.00 0.50	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60

Soil Survey of Young County, Texas

Table 18.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GfB: Grandfield-----	90	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
GnB: Grandfield-----	90	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
GnC: Grandfield-----	90	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
GrB: Grandmore-----	85	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
HeC: Heaton-----	85	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.10
HnB: Hensley-----	85	Very limited Depth to hard bedrock Low strength Shrink-swell	1.00 1.00 0.50	Very limited Depth to hard bedrock Cutbanks cave	1.00 0.10	Very limited Depth to bedrock Droughty	1.00 0.95
HsB: Hensley-----	85	Very limited Depth to hard bedrock Low strength Shrink-swell	1.00 1.00 0.50	Very limited Depth to hard bedrock	1.00	Very limited Large stones Depth to bedrock Droughty	1.00 1.00 0.95
JaB: Jacksboro-----	90	Very limited Depth to hard bedrock Shrink-swell	1.00 0.50	Very limited Depth to hard bedrock Cutbanks cave	1.00 0.10	Very limited Depth to bedrock Droughty	1.00 1.00
JrE: Jolly-----	68	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Cutbanks cave	1.00 0.10	Very limited Droughty Depth to bedrock	1.00 1.00
Rock outcrop-----	17	Not rated		Not rated		Not rated	
KaA: Kamay-----	85	Very limited Low strength Shrink-swell	1.00 1.00	Somewhat limited Cutbanks cave Too clayey	0.10 0.03	Very limited Sodium content	1.00

Soil Survey of Young County, Texas

Table 18.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KvE: Knoco-----	54	Very limited Depth to soft bedrock Low strength	1.00 1.00	Very limited Depth to soft bedrock Too clayey Dense layer Cutbanks cave	1.00 0.50 0.50 0.10	Very limited Depth to bedrock Droughty Too clayey Large stones	1.00 1.00 1.00 0.16
Vernon-----	41	Very limited Low strength Shrink-swell	1.00 1.00	Somewhat limited Depth to soft bedrock Too clayey Dense layer Cutbanks cave	0.84 0.50 0.50 0.10	Very limited Too clayey Sodium content Depth to bedrock Large stones	1.00 1.00 0.84 0.16
KvG: Knoco-----	35	Very limited Depth to soft bedrock Low strength Too steep	1.00 1.00 1.00	Very limited Depth to soft bedrock Too steep Too clayey Dense layer Cutbanks cave	1.00 1.00 0.50 0.50 0.10	Very limited Depth to bedrock Droughty Too steep Too clayey Large stones	1.00 1.00 1.00 1.00 0.16
Vernon-----	30	Very limited Shrink-swell Low strength Slope	1.00 1.00 0.01	Somewhat limited Depth to soft bedrock Too clayey Cutbanks cave Slope	0.99 0.50 0.10 0.01	Very limited Too clayey Sodium content Depth to bedrock Large stones Slope	1.00 1.00 0.99 0.08 0.01
LeB: Leeray-----	85	Very limited Shrink-swell Low strength	1.00 1.00	Very limited Cutbanks cave Too clayey	1.00 0.50	Very limited Too clayey Sodium content	1.00 1.00
LnA: Lincoln-----	90	Very limited Flooding	1.00	Very limited Cutbanks cave Flooding	1.00 0.60	Somewhat limited Droughty Flooding	0.89 0.60
LyB: Lindy-----	85	Very limited Low strength Shrink-swell Depth to hard bedrock	1.00 0.50 0.29	Very limited Depth to hard bedrock Too clayey Cutbanks cave	1.00 0.28 0.10	Somewhat limited Depth to bedrock	0.29
MwB: Minwells-----	85	Very limited Low strength Shrink-swell	1.00 0.50	Very limited Cutbanks cave	1.00	Not limited	

Soil Survey of Young County, Texas

Table 18.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NcB: Newcastle-----	85	Not limited		Somewhat limited Depth to soft bedrock	0.03	Somewhat limited Depth to bedrock	0.03
						Large stones	0.03
NeB: Newcastle-----	88	Not limited		Somewhat limited Depth to soft bedrock	0.64	Somewhat limited Depth to bedrock	0.65
				Cutbanks cave	0.10	Droughty	0.15
NoC: Newcastle-----	45	Not limited		Somewhat limited Depth to soft bedrock	0.20	Somewhat limited Depth to bedrock	0.20
				Cutbanks cave	0.10		
Jolly-----	40	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Very limited Depth to bedrock	1.00
				Cutbanks cave	0.10	Droughty	0.86
NuA: Nukrum-----	85	Very limited Low strength Shrink-swell	1.00 1.00	Somewhat limited Too clayey Cutbanks cave	0.41 0.10	Not limited	
OhG: Owens-----	59	Very limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Very limited Depth to bedrock	1.00
		Low strength	1.00	Too steep	1.00	Too steep	1.00
		Too steep	1.00	Too clayey	0.72	Too clayey	1.00
		Shrink-swell	0.96	Dense layer	0.50	Droughty	0.42
				Cutbanks cave	0.10		
Harpersville-----	36	Very limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Very limited Depth to bedrock	1.00
		Low strength	1.00	Too steep	1.00	Droughty	1.00
		Too steep	1.00	Too clayey	0.72	Too steep	1.00
		Shrink-swell	0.96	Dense layer	0.50	Too clayey	1.00
				Cutbanks cave	0.10		
OnE: Owens-----	85	Very limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Very limited Depth to bedrock	1.00
		Low strength	1.00	Too clayey	0.72	Too clayey	1.00
		Shrink-swell	0.96	Dense layer	0.50	Droughty	0.64
		Slope	0.04	Cutbanks cave	0.10	Slope	0.04
				Slope	0.04		
Ow: Oil-waste land-----	100	Not rated		Not rated		Not rated	

Soil Survey of Young County, Texas

Table 18.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PaA: Padgett-----	90	Very limited Flooding Low strength Shrink-swell	1.00 1.00 1.00	Very limited Cutbanks cave Too clayey Flooding	1.00 0.84 0.60	Very limited Too clayey Flooding	1.00 0.60
PaD: Palopinto-----	85	Very limited Depth to hard bedrock Large stones Low strength Shrink-swell	1.00 1.00 1.00 0.02	Very limited Depth to hard bedrock Large stones Cutbanks cave	1.00 1.00 0.10	Very limited Droughty Depth to bedrock Large stones	1.00 1.00 1.00
QU: Pits, quarry-----	100	Not rated		Not rated		Not rated	
RwB: Rowden-----	85	Very limited Low strength Shrink-swell Depth to hard bedrock	1.00 1.00 0.10	Very limited Depth to hard bedrock Too clayey Cutbanks cave	1.00 0.10 0.10	Somewhat limited Depth to bedrock	0.10
SaA: Sagerton-----	85	Very limited Low strength Shrink-swell	1.00 0.94	Somewhat limited Cutbanks cave	0.10	Not limited	
SaB: Sagerton-----	85	Very limited Low strength Shrink-swell	1.00 0.94	Somewhat limited Cutbanks cave	0.10	Not limited	
ScB: Springcreek-----	85	Somewhat limited Depth to hard bedrock	0.46	Very limited Depth to hard bedrock Cutbanks cave	1.00 1.00	Very limited Carbonate content Droughty Depth to bedrock	1.00 0.62 0.46
SeB: Set-----	85	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave Too clayey	0.10 0.01	Very limited Carbonate content	1.00

Soil Survey of Young County, Texas

Table 18.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SpG: Set-----	50	Very limited Low strength Too steep Shrink-swell	 1.00 1.00 0.50	Very limited Too steep Too clayey Cutbanks cave	 1.00 0.12 0.10	Very limited Too steep Carbonate content Large stones	 1.00 1.00 0.68
Palopinto-----	40	Very limited Depth to hard bedrock Large stones Low strength Slope Shrink-swell	 1.00 1.00 1.00 0.96 0.02	Very limited Depth to hard bedrock Large stones Slope Cutbanks cave	 1.00 1.00 0.96 0.10	Very limited Droughty Depth to bedrock Large stones Slope	 1.00 1.00 1.00 0.96
StF: Shatruce-----	85	Very limited Low strength Too steep Shrink-swell	 1.00 1.00 0.50	Very limited Too steep Depth to soft bedrock Cutbanks cave Too clayey	 1.00 0.79 0.10 0.03	Very limited Too steep Depth to bedrock Gravel Large stones	 1.00 0.80 0.33 0.01
StG: Shatruce-----	85	Very limited Low strength Too steep Shrink-swell	 1.00 1.00 0.50	Very limited Too steep Depth to soft bedrock Cutbanks cave Too clayey	 1.00 0.15 0.10 0.03	Very limited Too steep Gravel Depth to bedrock Large stones	 1.00 0.33 0.16 0.01
ThB: Thurber-----	85	Very limited Low strength Shrink-swell	 1.00 1.00	Somewhat limited Too clayey Cutbanks cave	 0.12 0.10	Not limited	
TkC: Throck-----	85	Very limited Shrink-swell Low strength	 1.00 1.00	Somewhat limited Too clayey Cutbanks cave	 0.50 0.10	Not limited	
TmB: Tillman-----	85	Very limited Low strength Shrink-swell	 1.00 1.00	Somewhat limited Cutbanks cave Too clayey	 0.10 0.03	Not limited	
TrB: Truce-----	85	Very limited Low strength Shrink-swell	 1.00 0.50	Somewhat limited Too clayey Cutbanks cave	 0.12 0.10	Not limited	
TrC: Truce-----	85	Very limited Low strength Shrink-swell	 1.00 0.50	Somewhat limited Too clayey Cutbanks cave	 0.12 0.10	Not limited	

Soil Survey of Young County, Texas

Table 18.--Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
VeC: Vernon-----	85	Very limited Low strength	1.00	Somewhat limited Depth to soft bedrock	0.64	Very limited Too clayey	1.00
		Shrink-swell	1.00	Too clayey Dense layer Cutbanks cave	0.50 0.50 0.10	Sodium content Depth to bedrock	1.00 0.65
W: Water-----	100	Not rated		Not rated		Not rated	
WaA: Westola-----	90	Very limited Flooding	1.00	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60
WdB: Weswind-----	85	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
WeA: Wheatwood-----	90	Very limited Flooding Low strength	1.00 1.00	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60
WhB: Wichita-----	90	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
WtB: Winters-----	85	Very limited Low strength Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	

Soil Survey of Young County, Texas

Table 19.--Sewage Disposal

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AbA: Abilene-----	85	Very limited Slow water movement	1.00	Not limited	
AnB: Anocon-----	90	Very limited Slow water movement	1.00	Very limited Seepage	1.00
BgB: Bluegrove-----	90	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to soft bedrock Seepage	1.00 0.32
BoB: Bonti-----	85	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to soft bedrock Seepage	1.00 0.27
BpC: Bastrop-----	90	Somewhat limited Slow water movement	0.50	Very limited Seepage Slope	1.00 0.08
BsB: Bastrop-----	85	Somewhat limited Slow water movement	0.50	Very limited Seepage	1.00
BsC2: Bastrop, eroded----	85	Somewhat limited Slow water movement	0.50	Somewhat limited Seepage Slope	0.50 0.08
CaC2: Callahan-----	90	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 0.32
ChB: Chaney-----	85	Very limited Slow water movement Depth to bedrock	1.00 0.41	Somewhat limited Depth to soft bedrock	0.02

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Table 19.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
CkA: Clearfork-----	90	Very limited Flooding Slow water movement	1.00 1.00	Very limited Flooding	1.00
DAM: Dams-----	100	Not rated		Not rated	
DeB: Decordova-----	90	Very limited Seepage, bottom layer	1.00	Very limited Seepage	1.00
DnB: Deandale-----	90	Very limited Slow water movement	1.00	Somewhat limited Seepage	0.50
EnB: Enterprise-----	85	Very limited Seepage, bottom layer	1.00	Very limited Seepage	1.00
EnC: Enterprise-----	85	Very limited Seepage, bottom layer	1.00	Very limited Seepage Slope	1.00 0.32
ExD: Exray-----	43	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 0.68 0.27
Loving-----	33	Very limited Depth to bedrock Seepage, bottom layer	1.00 1.00	Very limited Depth to soft bedrock Seepage Slope	1.00 1.00 0.68
GaB: Gageby-----	90	Very limited Flooding Slow water movement	1.00 0.50	Very limited Flooding Seepage	1.00 0.50
GdF: Goodnight-----	90	Very limited Seepage, bottom layer Filtering capacity Slope	1.00 1.00 0.16	Very limited Seepage Slope	1.00 1.00

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Table 19.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
GeA: Gowen-----	90	Very limited Flooding Slow water movement	1.00 0.50	Very limited Flooding Seepage	1.00 0.50
GfB: Grandfield-----	90	Very limited Seepage, bottom layer Slow water movement	1.00 0.50	Very limited Seepage	1.00
GnB: Grandfield-----	90	Very limited Seepage, bottom layer Slow water movement	1.00 0.50	Very limited Seepage	1.00
GnC: Grandfield-----	90	Very limited Seepage, bottom layer Slow water movement	1.00 0.50	Very limited Seepage Slope	1.00 0.32
GrB: Grandmore-----	85	Very limited Slow water movement	1.00	Very limited Seepage	1.00
HeC: Heaton-----	85	Somewhat limited Slow water movement	0.50	Very limited Seepage Slope	1.00 0.08
HnB: Hensley-----	85	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock Seepage	1.00 0.21
HsB: Hensley-----	85	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock Seepage	1.00 0.21
JaB: Jacksboro-----	90	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock Seepage	1.00 0.27

Soil Survey of Young County, Texas

Table 19.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
JrE: Jolly-----	68	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Slope	1.00 0.68
Rock outcrop-----	17	Not rated		Not rated	
KaA: Kamay-----	85	Very limited Slow water movement	1.00	Not limited	
KvE: Knoco-----	54	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
Vernon-----	41	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 0.68
KvG: Knoco-----	35	Very limited Slow water movement Depth to bedrock Too steep	1.00 1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
Vernon-----	30	Very limited Slow water movement Depth to bedrock Slope	1.00 1.00 0.01	Very limited Depth to soft bedrock Slope	1.00 1.00
LeB: Leeray-----	85	Very limited Slow water movement	1.00	Not limited	
LnA: Lincoln-----	90	Very limited Flooding Seepage, bottom layer Filtering capacity	1.00 1.00 1.00	Very limited Flooding Seepage	1.00 1.00
LyB: Lindy-----	85	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to hard bedrock Seepage	1.00 0.21

Soil Survey of Young County, Texas

Table 19.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
MwB: Minwells-----	85	Very limited Slow water movement Seepage, bottom layer	1.00 1.00	Not limited	
NcB: Newcastle-----	85	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to soft bedrock Seepage	1.00 0.50
NeB: Newcastle-----	88	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to soft bedrock Seepage	1.00 0.50
NoC: Newcastle-----	45	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to soft bedrock Seepage	1.00 0.50
Jolly-----	40	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Seepage Slope	1.00 0.50 0.08
NuA: Nukrum-----	85	Very limited Slow water movement	1.00	Not limited	
OhG: Owens-----	59	Very limited Slow water movement Depth to bedrock Too steep	1.00 1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
Harpersville-----	36	Very limited Slow water movement Depth to bedrock Too steep	1.00 1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
OnE: Owens-----	85	Very limited Slow water movement Depth to bedrock Slope	1.00 1.00 0.04	Very limited Depth to soft bedrock Slope	1.00 1.00
Ow: Oil-waste land-----	100	Not rated		Not rated	

Soil Survey of Young County, Texas

Table 19.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
PaA: Padgett-----	90	Very limited Flooding Slow water movement	1.00 1.00	Very limited Flooding	1.00
PaD: Palopinto-----	85	Very limited Depth to bedrock Large stones	1.00 1.00	Very limited Depth to hard bedrock Large stones Slope	1.00 0.97 0.08
QU: Pits, quarry-----	100	Not rated		Not rated	
RwB: Rowden-----	85	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to hard bedrock Seepage	1.00 0.50
SaA: Sagerton-----	85	Very limited Slow water movement	1.00	Somewhat limited Seepage	0.50
SaB: Sagerton-----	85	Very limited Slow water movement	1.00	Not limited	
ScB: Springcreek-----	85	Very limited Depth to bedrock Slow water movement	1.00 0.50	Very limited Depth to hard bedrock Seepage	1.00 0.50
SeB: Set-----	85	Very limited Slow water movement Depth to bedrock	1.00 0.69	Somewhat limited Depth to soft bedrock	0.26
SpG: Set-----	50	Very limited Slow water movement Too steep Depth to bedrock	1.00 1.00 0.96	Very limited Slope Depth to soft bedrock	1.00 0.88
Palopinto-----	40	Very limited Depth to bedrock Large stones Slope	1.00 1.00 0.96	Very limited Depth to hard bedrock Slope Large stones Seepage	1.00 1.00 1.00 0.50

Soil Survey of Young County, Texas

Table 19.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
StF: Shatruce-----	85	Very limited Slow water movement Depth to bedrock Too steep	1.00 1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
StG: Shatruce-----	85	Very limited Slow water movement Depth to bedrock Too steep	1.00 1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
ThB: Thurber-----	85	Very limited Slow water movement	1.00	Not limited	
TkC: Throck-----	85	Very limited Slow water movement Depth to bedrock	1.00 0.86	Somewhat limited Depth to soft bedrock Slope	0.61 0.08
TmB: Tillman-----	85	Very limited Slow water movement	1.00	Not limited	
TrB: Truce-----	85	Very limited Slow water movement Depth to bedrock	1.00 0.47	Somewhat limited Depth to soft bedrock	0.05
TrC: Truce-----	85	Very limited Slow water movement Depth to bedrock	1.00 0.96	Somewhat limited Depth to soft bedrock Slope	0.88 0.32
VeC: Vernon-----	85	Very limited Slow water movement Depth to bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 0.08
W: Water-----	100	Not rated		Not rated	
WaA: Westola-----	90	Very limited Flooding Seepage, bottom layer	1.00 1.00	Very limited Flooding Seepage	1.00 1.00

Soil Survey of Young County, Texas

Table 19.--Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
WdB: Weswind-----	85	Very limited Slow water movement	1.00	Not limited	
WeA: Wheatwood-----	90	Very limited Flooding Slow water movement	1.00 0.50	Very limited Flooding Seepage	1.00 0.50
WhB: Wichita-----	90	Very limited Slow water movement	1.00	Not limited	
WtB: Winters-----	85	Very limited Slow water movement	1.00	Somewhat limited Seepage	0.50

Soil Survey of Young County, Texas

Table 20.--Landfills

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AbA: Abilene-----	85	Somewhat limited Too clayey	0.50	Not limited		Very limited Too clayey	1.00
AnB: Anocon-----	90	Very limited Too clayey	1.00	Not limited		Very limited Too clayey	1.00
BgB: Bluegrove-----	90	Very limited Depth to bedrock Too clayey	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Too clayey Depth to bedrock	1.00 1.00
BoB: Bonti-----	85	Very limited Depth to bedrock Too clayey	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Too clayey Depth to bedrock	1.00 1.00
BpC: Bastrop-----	90	Not limited		Not limited		Not limited	
BsB: Bastrop-----	85	Not limited		Not limited		Not limited	
BsC2: Bastrop, eroded----	85	Not limited		Not limited		Not limited	
CaC2: Callahan-----	90	Very limited Depth to bedrock Too clayey	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Too clayey Depth to bedrock	1.00 1.00
ChB: Chaney-----	85	Very limited Depth to bedrock Too clayey	1.00 1.00	Somewhat limited Depth to bedrock	0.02	Very limited Too clayey Depth to bedrock	1.00 0.02
CkA: Clearfork-----	90	Very limited Flooding Too clayey	1.00 0.50	Very limited Flooding	1.00	Somewhat limited Too clayey	0.50
DAM: Dams-----	100	Not rated		Not rated		Not rated	
DeB: Decordova-----	90	Very limited Seepage, bottom layer	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.50

Soil Survey of Young County, Texas

Table 20.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DnB: Deandale-----	90	Very limited Too clayey	1.00	Not limited		Very limited Too clayey	1.00
EnB: Enterprise-----	85	Very limited Seepage, bottom layer	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.50
EnC: Enterprise-----	85	Very limited Seepage, bottom layer	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.50
ExD: Exray-----	43	Very limited Depth to bedrock Too clayey	1.00 0.50	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Too clayey	1.00 0.50
Loving-----	33	Very limited Depth to bedrock Seepage, bottom layer	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Seepage	1.00 0.50
GaB: Gageby-----	90	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	
GdF: Goodnight-----	90	Very limited Seepage, bottom layer Too sandy Slope	1.00 1.00 0.16	Very limited Seepage Slope	1.00 0.16	Very limited Too sandy Seepage Slope	1.00 1.00 0.16
GeA: Gowen-----	90	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	
GfB: Grandfield-----	90	Very limited Seepage, bottom layer	1.00	Not limited		Not limited	
GnB: Grandfield-----	90	Very limited Seepage, bottom layer	1.00	Not limited		Somewhat limited Seepage	0.50
GnC: Grandfield-----	90	Very limited Seepage, bottom layer	1.00	Not limited		Not limited	
GrB: Grandmore-----	85	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50

Soil Survey of Young County, Texas

Table 20.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HeC: Heaton-----	85	Not limited		Very limited Seepage	1.00	Not limited	
HnB: Hensley-----	85	Very limited Depth to bedrock Too clayey	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Too clayey	1.00 1.00
HsB: Hensley-----	85	Very limited Depth to bedrock Too clayey	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Too clayey	1.00 1.00
JaB: Jacksboro-----	90	Very limited Depth to bedrock Too clayey	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Too clayey Gravel content	1.00 1.00 0.97
JrE: Jolly-----	68	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Rock outcrop-----	17	Not rated		Very limited Depth to bedrock Not rated Seepage	1.00 1.00 1.00	Not rated	
KaA: Kamay-----	85	Very limited Too clayey Excess sodium	1.00 1.00	Not limited		Very limited Too clayey Sodium content	1.00 1.00
KvE: Knoco-----	54	Very limited Depth to bedrock	1.00	Not limited		Very limited Depth to bedrock	1.00
Vernon-----	41	Very limited Depth to bedrock Too clayey Excess sodium	1.00 1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Too clayey Depth to bedrock Sodium content	1.00 1.00 1.00
KvG: Knoco-----	35	Very limited Depth to bedrock Too steep	1.00 1.00	Very limited Too steep	1.00	Very limited Depth to bedrock Too steep	1.00 1.00
Vernon-----	30	Very limited Depth to bedrock Too clayey Excess sodium Slope	1.00 1.00 1.00 0.01	Very limited Depth to bedrock Slope	1.00 0.01	Very limited Too clayey Hard to compact Depth to bedrock Sodium content Slope	1.00 1.00 1.00 1.00 0.01

Soil Survey of Young County, Texas

Table 20.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LeB: Leeray-----	85	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
LnA: Lincoln-----	90	Very limited Flooding Seepage, bottom layer Too sandy	1.00 1.00 1.00	Very limited Flooding Seepage	1.00 1.00	Very limited Too sandy Seepage	1.00 1.00
LyB: Lindy-----	85	Very limited Depth to bedrock Too clayey	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Too clayey Depth to bedrock	1.00 1.00
MwB: Minwells-----	85	Very limited Too clayey Seepage, bottom layer	1.00 1.00	Not limited		Very limited Too clayey	1.00
NcB: Newcastle-----	85	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
NeB: Newcastle-----	88	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
NoC: Newcastle-----	45	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Jolly-----	40	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
NuA: Nukrum-----	85	Very limited Too clayey	1.00	Not limited		Very limited Too clayey	1.00
OhG: Owens-----	59	Very limited Depth to bedrock Too clayey Too steep	1.00 1.00 1.00	Very limited Depth to bedrock Too steep	1.00 1.00	Very limited Depth to bedrock Too clayey Too steep	1.00 1.00 1.00
Harpersville-----	36	Very limited Depth to bedrock Too steep	1.00 1.00	Very limited Too steep	1.00	Very limited Depth to bedrock Too steep	1.00 1.00
OnE: Owens-----	85	Very limited Depth to bedrock Too clayey Slope	1.00 1.00 0.04	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Too clayey Hard to compact Slope	1.00 1.00 1.00 0.04

Soil Survey of Young County, Texas

Table 20.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ow: Oil-waste land-----	100	Not rated		Very limited Not rated Seepage	1.00 1.00	Not rated	
PaA: Padgett-----	90	Very limited Flooding Too clayey	1.00 1.00	Very limited Flooding	1.00	Very limited Too clayey	1.00
PaD: Palopinto-----	85	Very limited Depth to bedrock Large stones	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Large stones	1.00 1.00
QU: Pits, quarry-----	100	Not rated		Not rated		Not rated	
RwB: Rowden-----	85	Very limited Depth to bedrock Too clayey	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Too clayey Depth to bedrock	1.00 1.00
SaA: Sagerton-----	85	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
SaB: Sagerton-----	85	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
ScB: Springcreek-----	85	Very limited Depth to bedrock Too clayey	1.00 0.50	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Carbonate content Too clayey Gravel content	1.00 1.00 0.50 0.14
SeB: Set-----	85	Very limited Depth to bedrock Too clayey	1.00 0.50	Somewhat limited Depth to bedrock	0.26	Very limited Carbonate content Too clayey Depth to bedrock	1.00 0.50 0.26
SpG: Set-----	50	Very limited Depth to bedrock Too clayey Too steep	1.00 1.00 1.00	Very limited Too steep Depth to bedrock	1.00 0.88	Very limited Too clayey Too steep Carbonate content Depth to bedrock	1.00 1.00 1.00 0.88
Palopinto-----	40	Very limited Depth to bedrock Large stones Slope	1.00 1.00 0.96	Very limited Depth to bedrock Slope	1.00 0.96	Very limited Depth to bedrock Large stones Slope	1.00 1.00 0.96

Soil Survey of Young County, Texas

Table 20.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
StF: Shatruce-----	85	Very limited Depth to bedrock Too clayey Too steep	1.00 1.00 1.00	Very limited Depth to bedrock Too steep	1.00 1.00	Very limited Too clayey Depth to bedrock Too steep	1.00 1.00 1.00
StG: Shatruce-----	85	Very limited Depth to bedrock Too clayey Too steep	1.00 1.00 1.00	Very limited Depth to bedrock Too steep	1.00 1.00	Very limited Too clayey Depth to bedrock Too steep	1.00 1.00 1.00
ThB: Thurber-----	85	Very limited Too clayey	1.00	Not limited		Very limited Too clayey	1.00
TkC: Throck-----	85	Very limited Depth to bedrock Too clayey	1.00 1.00	Somewhat limited Depth to bedrock	0.61	Very limited Too clayey Depth to bedrock	1.00 0.61
TmB: Tillman-----	85	Very limited Too clayey	1.00	Not limited		Very limited Too clayey	1.00
TrB: Truce-----	85	Very limited Depth to bedrock Too clayey	1.00 1.00	Somewhat limited Depth to bedrock	0.05	Very limited Too clayey Depth to bedrock	1.00 0.05
TrC: Truce-----	85	Very limited Depth to bedrock Too clayey	1.00 1.00	Somewhat limited Depth to bedrock	0.88	Very limited Too clayey Depth to bedrock	1.00 0.88
VeC: Vernon-----	85	Very limited Depth to bedrock Too clayey Excess sodium	1.00 1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Too clayey Hard to compact Depth to bedrock Sodium content	1.00 1.00 1.00 1.00
W: Water-----	100	Not rated		Not rated		Not rated	
WaA: Westola-----	90	Very limited Flooding Seepage, bottom layer	1.00 1.00	Very limited Flooding Seepage	1.00 1.00	Somewhat limited Seepage	0.50
WdB: Weswind-----	85	Very limited Too clayey	1.00	Not limited		Very limited Too clayey	1.00

Soil Survey of Young County, Texas

Table 20.--Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WeA: Wheatwood-----	90	Very limited Flooding Too clayey	1.00 0.50	Very limited Flooding	1.00	Somewhat limited Too clayey	0.50
WhB: Wichita-----	90	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
WtB: Winters-----	85	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50

Soil Survey of Young County, Texas

Table 21.--Source of Gravel and Sand

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
AbA: Abilene-----	85	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
AnB: Anocon-----	90	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
BgB: Bluegrove-----	90	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
BoB: Bonti-----	85	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
BpC: Bastrop-----	90	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
BsB: Bastrop-----	85	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
BsC2: Bastrop, eroded----	85	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
CaC2: Callahan-----	90	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
ChB: Chaney-----	85	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
CkA: Clearfork-----	90	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00

Soil Survey of Young County, Texas

Table 21.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
DAM: Dams-----	100	Not rated		Not rated	
DeB: Decordova-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.05
DnB: Deandale-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
EnB: Enterprise-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
EnC: Enterprise-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
ExD: Exray-----	43	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Loving-----	33	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
GaB: Gageby-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
GdF: Goodnight-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.25 0.25
GeA: Gowen-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
GfB: Grandfield-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
GnB: Grandfield-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

Soil Survey of Young County, Texas

Table 21.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
GnC: Grandfield-----	90	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
GrB: Grandmore-----	85	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
HeC: Heaton-----	85	Poor Bottom layer Thickest layer	 0.00 0.00	Fair Bottom layer Thickest layer	 0.00 0.31
HnB: Hensley-----	85	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
HsB: Hensley-----	85	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
JaB: Jacksboro-----	90	Fair Thickest layer Bottom layer	 0.00 0.06	Poor Bottom layer Thickest layer	 0.00 0.00
JrE: Jolly-----	68	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Rock outcrop-----	17	Not rated		Not rated	
KaA: Kamay-----	85	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
KvE: Knoco-----	54	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00
Vernon-----	41	Poor Bottom layer Thickest layer	 0.00 0.00	Poor Bottom layer Thickest layer	 0.00 0.00

Soil Survey of Young County, Texas

Table 21.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
KvG: Knoco-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Vernon-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
LeB: Leeray-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
LnA: Lincoln-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.03 0.11
LyB: Lindy-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
MwB: Minwells-----	85	Fair Thickest layer Bottom layer	0.00 0.12	Fair Thickest layer Bottom layer	0.00 0.51
NcB: Newcastle-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
NeB: Newcastle-----	88	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
NoC: Newcastle-----	45	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Jolly-----	40	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
NuA: Nukrum-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
OhG: Owens-----	59	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Harpersville-----	36	Poor Bottom layer Thickest layer	0.00 0.00	Not rated	

Soil Survey of Young County, Texas

Table 21.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
OnE: Owens-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ow: Oil-waste land-----	100	Not rated		Not rated	
PaA: Padgett-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
PaD: Palopinto-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
QU: Pits, quarry-----	100	Not rated		Not rated	
RwB: Rowden-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
SaA: Sagerton-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
SaB: Sagerton-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
ScB: Springcreek-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
SeB: Set-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
SpG: Set-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Palopinto-----	40	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

Soil Survey of Young County, Texas

Table 21.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
StF: Shatruce-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
StG: Shatruce-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
ThB: Thurber-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
TkC: Throck-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
TmB: Tillman-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
TrB: Truce-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
TrC: Truce-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
VeC: Vernon-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
W: Water-----	100	Not rated		Not rated	
WaA: Westola-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.07
WdB: Weswind-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
WeA: Wheatwood-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

Soil Survey of Young County, Texas

Table 21.--Source of Gravel and Sand--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
WhB: Wichita-----	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WtB: Winters-----	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Soil Survey of Young County, Texas

Table 22.--Source of Reclamation Material, Roadfill, and Topsoil

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AbA: Abilene-----	85	Poor Too clayey Organic matter content low Carbonate content Water erosion	0.00 0.60 0.68 0.99	Poor Low strength Shrink-swell	0.00 0.87	Poor Too clayey	0.00
AnB: Anocon-----	90	Poor Too clayey Organic matter content low	0.00 0.88	Poor Low strength Shrink-swell	0.00 0.94	Poor Too clayey	0.00
BgB: Bluegrove-----	90	Poor Too clayey Depth to bedrock Droughty	0.00 0.84 0.99	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.87	Poor Too clayey Depth to bedrock	0.00 0.84
BoB: Bonti-----	85	Poor Too clayey Droughty Organic matter content low Depth to bedrock Too acid	0.00 0.14 0.18 0.21 0.74	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.87	Poor Too clayey Depth to bedrock	0.00 0.21
BpC: Bastrop-----	90	Poor Wind erosion Organic matter content low	0.00 0.75	Good		Good	
BsB: Bastrop-----	85	Fair Organic matter content low Water erosion	0.75 0.99	Good		Good	
BsC2: Bastrop, eroded-----	85	Fair Organic matter content low Water erosion	0.75 0.99	Good		Good	
CaC2: Callahan-----	90	Poor Too clayey Depth to bedrock Organic matter content low	0.00 0.84 0.88	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.87	Poor Too clayey Depth to bedrock	0.00 0.84

Soil Survey of Young County, Texas

Table 22.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ChB: Chaney-----	85	Poor Wind erosion Too clayey Organic matter content low	0.00 0.00 0.60	Poor Low strength Shrink-swell Depth to bedrock	0.00 0.89 0.98	Poor Too clayey	0.00
CkA: Clearfork-----	90	Fair Too clayey Organic matter content low	0.12 0.32	Poor Low strength Shrink-swell	0.00 0.87	Fair Too clayey	0.11
DAM: Dams-----	100	Not rated		Not rated		Not rated	
DeB: Decordova-----	90	Poor Wind erosion Organic matter content low	0.00 0.68	Good		Good	
DnB: Deandale-----	90	Poor Too clayey Sodium content Organic matter content low Water erosion	0.00 0.40 0.88 0.90	Poor Low strength Shrink-swell	0.00 0.10	Poor Too clayey Sodium content	0.00 0.40
EnB: Enterprise-----	85	Fair Organic matter content low Carbonate content Water erosion	0.18 0.80 0.90	Good		Fair Carbonate content	0.96
EnC: Enterprise-----	85	Fair Organic matter content low Carbonate content Water erosion	0.18 0.80 0.90	Good		Fair Carbonate content	0.91
ExD: Exray-----	43	Poor Droughty Depth to bedrock Too clayey Organic matter content low Too acid	0.00 0.00 0.01 0.12 0.95	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.87	Poor Depth to bedrock Too clayey Rock fragments	0.00 0.00 0.96
Loving-----	33	Poor Droughty Depth to bedrock Organic matter content low Stone content	0.00 0.00 0.12 0.45	Poor Depth to bedrock	0.00	Poor Depth to bedrock Rock fragments	0.00 0.88

Soil Survey of Young County, Texas

Table 22.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GaB: Gageby-----	90	Good		Poor Low strength Shrink-swell	0.00 0.87	Good	
GdF: Goodnight-----	90	Poor Wind erosion Too sandy Organic matter content low Droughty	0.00 0.00 0.88 0.99	Good		Poor Too sandy Slope	0.00 0.84
GeA: Gowen-----	90	Good		Poor Low strength Shrink-swell	0.00 0.87	Good	
GfB: Grandfield-----	90	Poor Wind erosion Organic matter content low	0.00 0.50	Good		Good	
GnB: Grandfield-----	90	Fair Organic matter content low	0.12	Good		Good	
GnC: Grandfield-----	90	Fair Organic matter content low	0.50	Good		Good	
GrB: Grandmore-----	85	Fair Organic matter content low	0.05	Poor Low strength	0.00	Good	
HeC: Heaton-----	85	Poor Too sandy Wind erosion Organic matter content low	0.00 0.00 0.88	Good		Poor Too sandy	0.00
HnB: Hensley-----	85	Poor Droughty Depth to bedrock Too clayey Organic matter content low Water erosion	0.00 0.00 0.00 0.12 0.99	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.87	Poor Depth to bedrock Too clayey Rock fragments	0.00 0.00 0.97

Soil Survey of Young County, Texas

Table 22.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HsB: Hensley-----	85	Poor Droughty Depth to bedrock Too clayey Organic matter content low	0.00 0.00 0.00 0.60	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.87	Poor Depth to bedrock Too clayey Rock fragments	0.00 0.00 0.27
JaB: Jacksboro-----	90	Poor Droughty Depth to bedrock Too clayey Too acid Organic matter content low	0.00 0.00 0.00 0.84 0.88	Poor Depth to bedrock Shrink-swell	0.00 0.94	Poor Rock fragments Depth to bedrock Too clayey	0.00 0.00 0.00
JrE: Jolly-----	68	Poor Droughty Depth to bedrock Organic matter content low	0.00 0.00 0.92	Poor Depth to bedrock	0.00	Poor Depth to bedrock	0.00
Rock outcrop-----	17	Not rated		Not rated		Not rated	
KaA: Kamay-----	85	Poor Too clayey Sodium content Water erosion	0.00 0.00 0.99	Poor Low strength Shrink-swell	0.00 0.17	Poor Too clayey Sodium content Salinity	0.00 0.00 0.50
KvE: Knoco-----	54	Poor Too clayey Depth to bedrock Droughty Organic matter content low	0.00 0.00 0.00 0.05	Poor Depth to bedrock Low strength	0.00 0.00	Poor Too clayey Depth to bedrock	0.00 0.00
Vernon-----	41	Poor Too clayey Depth to bedrock Sodium content Carbonate content Organic matter content low	0.00 0.16 0.40 0.80 0.88	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.12	Poor Too clayey Depth to bedrock Sodium content Carbonate content	0.00 0.16 0.40 0.98
KvG: Knoco-----	35	Poor Too clayey Depth to bedrock Droughty Organic matter content low	0.00 0.00 0.00 0.05	Poor Depth to bedrock Low strength Slope	0.00 0.00 0.50	Poor Too clayey Depth to bedrock Slope	0.00 0.00 0.00

Soil Survey of Young County, Texas

Table 22.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Vernon-----	30	Poor Too clayey Depth to bedrock Sodium content Carbonate content Organic matter content low	0.00 0.00 0.40 0.80 0.88	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.12	Poor Too clayey Depth to bedrock Sodium content Salinity Carbonate content	0.00 0.00 0.40 0.88 0.99
LeB: Leeray-----	85	Poor Too clayey Carbonate content Salinity	0.00 0.80 0.88	Poor Shrink-swell Low strength	0.00 0.00	Poor Too clayey	0.00
LnA: Lincoln-----	90	Poor Too sandy Organic matter content low Droughty	0.00 0.12 0.53	Good		Poor Too sandy	0.00
LyB: Lindy-----	85	Poor Too clayey Organic matter content low Depth to bedrock Droughty	0.00 0.18 0.71 0.75	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.87	Poor Too clayey Depth to bedrock	0.00 0.71
MwB: Minwells-----	85	Poor Too clayey Organic matter content low	0.00 0.60	Poor Low strength Shrink-swell	0.00 0.87	Poor Too clayey	0.00
NcB: Newcastle-----	85	Fair Droughty Too acid Organic matter content low Depth to bedrock	0.31 0.84 0.88 0.97	Poor Depth to bedrock	0.00	Fair Rock fragments Depth to bedrock	0.88 0.97
NeB: Newcastle-----	88	Fair Organic matter content low Droughty Depth to bedrock	0.01 0.05 0.35	Poor Depth to bedrock	0.00	Fair Depth to bedrock	0.35
NoC: Newcastle-----	45	Fair Droughty Depth to bedrock Organic matter content low	0.57 0.79 0.88	Poor Depth to bedrock	0.00	Fair Depth to bedrock	0.79

Soil Survey of Young County, Texas

Table 22.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Jolly-----	40	Poor Droughty Depth to bedrock Organic matter content low	0.00 0.00 0.92	Poor Depth to bedrock	0.00	Poor Depth to bedrock	0.00
NuA: Nukrum-----	85	Poor Too clayey Carbonate content Organic matter content low	0.00 0.80 0.88	Poor Low strength Shrink-swell	0.00 0.12	Poor Too clayey	0.00
OhG: Owens-----	59	Poor Too clayey Depth to bedrock Droughty Organic matter content low Water erosion	0.00 0.00 0.12 0.18 0.99	Poor Depth to bedrock Low strength Shrink-swell Slope	0.00 0.00 0.62 0.68	Poor Too clayey Depth to bedrock Slope	0.00 0.00 0.00
Harpersville-----	36	Poor Too clayey Depth to bedrock Droughty Organic matter content low Water erosion	0.00 0.00 0.00 0.18 0.99	Poor Depth to bedrock Low strength Slope Shrink-swell	0.00 0.00 0.00 0.62	Poor Too clayey Depth to bedrock Slope	0.00 0.00 0.00
OnE: Owens-----	85	Poor Too clayey Depth to bedrock Droughty Organic matter content low Water erosion	0.00 0.00 0.05 0.18 0.99	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.62	Poor Too clayey Depth to bedrock Slope	0.00 0.00 0.96
Ow: Oil-waste land-----	100	Not rated		Not rated		Not rated	
PaA: Padgett-----	90	Poor Too clayey Organic matter content low Sodium content	0.00 0.94 0.97	Poor Low strength Shrink-swell	0.00 0.27	Poor Too clayey Sodium content	0.00 0.98
PaD: Palopinto-----	85	Poor Droughty Depth to bedrock Cobble content Stone content	0.00 0.00 0.00 0.62	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.99	Poor Rock fragments Depth to bedrock	0.00 0.00
QU: Pits, quarry-----	100	Not rated		Not rated		Not rated	

Soil Survey of Young County, Texas

Table 22.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RWB: Rowden-----	85	Poor Too clayey Depth to bedrock Droughty	0.00 0.90 0.90	Poor Low strength Depth to bedrock Shrink-swell	0.00 0.00 0.13	Poor Too clayey Depth to bedrock Rock fragments	0.00 0.90 0.97
SaA: Sagerton-----	85	Fair Too clayey Organic matter content low Carbonate content	0.02 0.24 0.68	Poor Low strength Shrink-swell	0.00 0.86	Fair Too clayey	0.02
SaB: Sagerton-----	85	Fair Too clayey Carbonate content	0.02 0.68	Poor Low strength Shrink-swell	0.00 0.79	Fair Too clayey	0.02
ScB: Springcreek-----	85	Poor Carbonate content Droughty Depth to bedrock Organic matter content low	0.00 0.00 0.54 0.60	Poor Depth to bedrock	0.00	Poor Carbonate content Rock fragments Depth to bedrock	0.00 0.00 0.54
SeB: Set-----	85	Poor Carbonate content Too clayey Organic matter content low	0.00 0.12 0.88	Poor Low strength Depth to bedrock Shrink-swell	0.00 0.74 0.87	Poor Carbonate content Too clayey	0.00 0.09
SpG: Set-----	50	Poor Carbonate content Too clayey Organic matter content low	0.00 0.00 0.60	Poor Low strength Slope Depth to bedrock Shrink-swell	0.00 0.02 0.12 0.87	Poor Carbonate content Too clayey Slope	0.00 0.00 0.00
Palopinto-----	40	Poor Droughty Depth to bedrock Cobble content Stone content	0.00 0.00 0.00 0.56	Poor Depth to bedrock Low strength Cobble content Shrink-swell	0.00 0.00 0.89 0.99	Poor Rock fragments Depth to bedrock Slope	0.00 0.00 0.04
StF: Shatruce-----	85	Poor Too clayey Depth to bedrock Organic matter content low Too acid	0.00 0.21 0.50 0.68	Poor Depth to bedrock Low strength Slope Shrink-swell	0.00 0.00 0.68 0.87	Poor Too clayey Slope Depth to bedrock	0.00 0.00 0.21

Soil Survey of Young County, Texas

Table 22.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
StG: Shatruce-----	85	Poor Too clayey Organic matter content low Too acid Depth to bedrock	 0.00 0.50 0.68 0.84	Poor Depth to bedrock Low strength Slope Shrink-swell	 0.00 0.00 0.00 0.87	Poor Slope Too clayey Depth to bedrock	 0.00 0.00 0.84
ThB: Thurber-----	85	Poor Too clayey Organic matter content low Water erosion Sodium content	 0.00 0.60 0.90 0.90	Poor Low strength Shrink-swell	 0.00 0.12	Poor Too clayey Sodium content	 0.00 0.90
TkC: Throck-----	85	Poor Too clayey Carbonate content Organic matter content low Sodium content	 0.00 0.46 0.88 0.97	Poor Low strength Shrink-swell Depth to bedrock	 0.00 0.12 0.39	Poor Too clayey Rock fragments Sodium content	 0.00 0.41 0.98
TmB: Tillman-----	85	Poor Too clayey Organic matter content low Carbonate content	 0.00 0.18 0.68	Poor Low strength Shrink-swell	 0.00 0.12	Poor Too clayey	 0.00
TrB: Truce-----	85	Poor Too clayey Organic matter content low Water erosion	 0.00 0.88 0.99	Poor Low strength Shrink-swell Depth to bedrock	 0.00 0.87 0.95	Poor Too clayey	 0.00
TrC: Truce-----	85	Poor Too clayey Organic matter content low Water erosion	 0.00 0.88 0.99	Poor Low strength Depth to bedrock Shrink-swell	 0.00 0.12 0.87	Poor Too clayey	 0.00
VeC: Vernon-----	85	Poor Too clayey Depth to bedrock Sodium content Organic matter content low Carbonate content	 0.00 0.35 0.40 0.60 0.80	Poor Depth to bedrock Low strength Shrink-swell	 0.00 0.00 0.12	Poor Too clayey Depth to bedrock Sodium content Carbonate content	 0.00 0.35 0.40 0.98
W: Water-----	100	Not rated		Not rated		Not rated	

Soil Survey of Young County, Texas

Table 22.--Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WaA: Westola-----	90	Fair Organic matter content low	0.12	Good		Good	
WdB: Weswind-----	85	Poor Too clayey Organic matter content low Carbonate content Too acid	0.00 0.88 0.92 0.95	Poor Low strength Shrink-swell	0.00 0.89	Poor Too clayey	0.00
WeA: Wheatwood-----	90	Fair Organic matter content low Water erosion	0.88 0.90	Poor Low strength	0.00	Good	
WhB: Wichita-----	90	Fair Too clayey Carbonate content Organic matter content low	0.02 0.68 0.88	Poor Low strength Shrink-swell	0.00 0.87	Fair Too clayey	0.01
WtB: Winters-----	85	Fair Too clayey Carbonate content Organic matter content low	0.02 0.80 0.88	Poor Low strength Shrink-swell	0.00 0.87	Fair Too clayey	0.01

Soil Survey of Young County, Texas

Table 23.--Ponds and Embankments

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AbA: Abilene-----	85	Somewhat limited Seepage	0.03	Somewhat limited Piping	0.03	Very limited Depth to water	1.00
AnB: Anocon-----	90	Somewhat limited Seepage	0.03	Somewhat limited Piping	0.52	Very limited Depth to water	1.00
BgB: Bluegrove-----	90	Somewhat limited Seepage Depth to bedrock	0.57 0.05	Somewhat limited Thin layer Piping	0.74 0.05	Very limited Depth to water	1.00
BoB: Bonti-----	85	Somewhat limited Seepage Depth to bedrock	0.53 0.23	Somewhat limited Thin layer Piping	0.95 0.41	Very limited Depth to water	1.00
BpC: Bastrop-----	90	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Very limited Depth to water	1.00
BsB: Bastrop-----	85	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Very limited Depth to water	1.00
BsC2: Bastrop, eroded----	85	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.95	Very limited Depth to water	1.00
CaC2: Callahan-----	90	Somewhat limited Slope Depth to bedrock	0.08 0.05	Somewhat limited Piping	0.10	Very limited Depth to water	1.00
ChB: Chaney-----	85	Somewhat limited Depth to bedrock	0.01	Somewhat limited Piping	0.02	Very limited Depth to water	1.00
CkA: Clearfork-----	90	Somewhat limited Seepage	0.03	Somewhat limited Hard to pack	0.18	Very limited Depth to water	1.00
DAM: Dams-----	100	Not rated		Not rated		Not rated	
DeB: Decordova-----	90	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Depth to water	1.00
DnB: Deandale-----	90	Not limited		Very limited Piping	1.00	Very limited Depth to water	1.00

Soil Survey of Young County, Texas

Table 23.--Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EnB: Enterprise-----	85	Very limited Seepage	1.00	Very limited Piping	1.00	Very limited Depth to water	1.00
EnC: Enterprise-----	85	Very limited Seepage Slope	1.00 0.08	Very limited Piping	1.00	Very limited Depth to water	1.00
ExD: Exray-----	43	Somewhat limited Depth to bedrock Seepage Slope	0.78 0.53 0.32	Very limited Thin layer Piping	1.00 0.58	Very limited Depth to water	1.00
Loving-----	33	Somewhat limited Depth to bedrock Slope	0.61 0.32	Very limited Thin layer	1.00	Very limited Depth to water	1.00
GaB: Gageby-----	90	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.23	Very limited Depth to water	1.00
GdF: Goodnight-----	90	Very limited Seepage Slope	1.00 1.00	Somewhat limited Seepage	0.66	Very limited Depth to water	1.00
GeA: Gowen-----	90	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.12	Very limited Depth to water	1.00
GfB: Grandfield-----	90	Very limited Seepage	1.00	Not limited		Very limited Depth to water	1.00
GnB: Grandfield-----	90	Very limited Seepage	1.00	Not limited		Very limited Depth to water	1.00
GnC: Grandfield-----	90	Very limited Seepage Slope	1.00 0.08	Not limited		Very limited Depth to water	1.00
GrB: Grandmore-----	85	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.94	Very limited Depth to water	1.00
HeC: Heaton-----	85	Very limited Seepage	1.00	Not limited		Very limited Depth to water	1.00
HnB: Hensley-----	85	Very limited Depth to bedrock Seepage	1.00 0.45	Very limited Thin layer	1.00	Very limited Depth to water	1.00

Soil Survey of Young County, Texas

Table 23.--Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HsB: Hensley-----	85	Very limited Depth to bedrock	1.00	Very limited Thin layer	1.00	Very limited Depth to water	1.00
JaB: Jacksboro-----	90	Very limited Depth to bedrock Seepage	1.00 0.53	Very limited Thin layer Seepage	1.00 0.07	Very limited Depth to water	1.00
JrE: Jolly-----	68	Somewhat limited Depth to bedrock Slope	0.78 0.32	Very limited Thin layer	1.00	Very limited Depth to water	1.00
Rock outcrop-----	17	Very limited Depth to bedrock Not rated Seepage Slope	1.00 1.00 1.00 0.68	Not rated		Not rated	
KaA: Kamay-----	85	Not limited		Very limited Piping	1.00	Very limited Depth to water	1.00
KvE: Knoco-----	54	Somewhat limited Depth to bedrock Slope	0.96 0.92	Not limited		Very limited Depth to water	1.00
Vernon-----	41	Somewhat limited Slope Depth to bedrock	0.32 0.26	Very limited Piping	1.00	Very limited Depth to water	1.00
KvG: Knoco-----	35	Very limited Slope Depth to bedrock	1.00 0.87	Not limited		Very limited Depth to water	1.00
Vernon-----	30	Very limited Slope Depth to bedrock	1.00 0.45	Very limited Piping	1.00	Very limited Depth to water	1.00
LeB: Leeray-----	85	Not limited		Very limited Hard to pack Salinity	1.00 0.12	Very limited Depth to water	1.00
LnA: Lincoln-----	90	Very limited Seepage	1.00	Not limited		Very limited Depth to water	1.00
LyB: Lindy-----	85	Somewhat limited Depth to bedrock Seepage	0.81 0.45	Somewhat limited Thin layer	0.81	Very limited Depth to water	1.00
MwB: Minwells-----	85	Very limited Seepage	1.00	Somewhat limited Piping	0.01	Very limited Depth to water	1.00

Soil Survey of Young County, Texas

Table 23.--Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NcB: Newcastle-----	85	Somewhat limited Seepage Depth to bedrock	0.70 0.02	Not limited		Very limited Depth to water	1.00
NeB: Newcastle-----	88	Somewhat limited Seepage Depth to bedrock	0.70 0.17	Not limited		Very limited Depth to water	1.00
NoC: Newcastle-----	45	Somewhat limited Seepage Depth to bedrock	0.70 0.06	Not limited		Very limited Depth to water	1.00
Jolly-----	40	Somewhat limited Depth to bedrock	0.50	Very limited Thin layer	1.00	Very limited Depth to water	1.00
NuA: Nukrum-----	85	Not limited		Somewhat limited Hard to pack	0.60	Very limited Depth to water	1.00
OhG: Owens-----	59	Very limited Slope Depth to bedrock	1.00 0.50	Somewhat limited Hard to pack	0.25	Very limited Depth to water	1.00
Harpersville-----	36	Very limited Slope Depth to bedrock	1.00 0.90	Somewhat limited Hard to pack	0.24	Very limited Depth to water	1.00
OnE: Owens-----	85	Very limited Slope Depth to bedrock	1.00 0.58	Somewhat limited Hard to pack	0.25	Very limited Depth to water	1.00
Ow: Oil-waste land-----	100	Very limited Not rated Seepage	1.00 1.00	Not rated		Not rated	
PaA: Padgett-----	90	Not limited		Very limited Hard to pack	1.00	Very limited Depth to water	1.00
PaD: Palopinto-----	85	Very limited Depth to bedrock Seepage	1.00 0.02	Very limited Thin layer Large stones	1.00 1.00	Very limited Depth to water	1.00
QU: Pits, quarry-----	100	Not rated		Not rated		Not rated	
RwB: Rowden-----	85	Somewhat limited Depth to bedrock Seepage	0.69 0.02	Somewhat limited Thin layer	0.70	Very limited Depth to water	1.00

Soil Survey of Young County, Texas

Table 23.--Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SaA: Sagerton-----	85	Somewhat limited Seepage	0.03	Somewhat limited Piping	0.33	Very limited Depth to water	1.00
SaB: Sagerton-----	85	Somewhat limited Seepage	0.03	Somewhat limited Piping	0.13	Very limited Depth to water	1.00
ScB: Springcreek-----	85	Somewhat limited Depth to bedrock Seepage	0.86 0.70	Somewhat limited Thin layer	0.86	Very limited Depth to water	1.00
SeB: Set-----	85	Somewhat limited Depth to bedrock	0.01	Not limited		Very limited Depth to water	1.00
SpG: Set-----	50	Very limited Slope Depth to bedrock	1.00 0.01	Not limited		Very limited Depth to water	1.00
Palopinto-----	40	Very limited Slope Depth to bedrock Seepage	1.00 1.00 0.02	Very limited Thin layer Large stones	1.00 1.00	Very limited Depth to water	1.00
StF: Shatruce-----	85	Very limited Slope Depth to bedrock	1.00 0.23	Somewhat limited Piping	0.94	Very limited Depth to water	1.00
StG: Shatruce-----	85	Very limited Slope Depth to bedrock	1.00 0.05	Somewhat limited Piping	0.49	Very limited Depth to water	1.00
ThB: Thurber-----	85	Not limited		Somewhat limited Piping	0.10	Very limited Depth to water	1.00
TkC: Throck-----	85	Somewhat limited Depth to bedrock	0.01	Very limited Hard to pack	1.00	Very limited Depth to water	1.00
TmB: Tillman-----	85	Not limited		Not limited		Very limited Depth to water	1.00
TrB: Truce-----	85	Somewhat limited Depth to bedrock	0.01	Somewhat limited Piping	0.05	Very limited Depth to water	1.00
TrC: Truce-----	85	Somewhat limited Slope Depth to bedrock	0.08 0.01	Somewhat limited Piping	0.33	Very limited Depth to water	1.00

Soil Survey of Young County, Texas

Table 23.--Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
VeC: Vernon-----	85	Somewhat limited Depth to bedrock	0.17	Very limited Piping	1.00	Very limited Depth to water	1.00
W: Water-----	100	Not rated		Not rated		Not rated	
WaA: Westola-----	90	Very limited Seepage	1.00	Very limited Piping	1.00	Very limited Depth to water	1.00
WdB: Weswind-----	85	Somewhat limited Seepage	0.03	Somewhat limited Piping	0.01	Very limited Depth to water	1.00
WeA: Wheatwood-----	90	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.88	Very limited Depth to water	1.00
WhB: Wichita-----	90	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.14	Very limited Depth to water	1.00
WtB: Winters-----	85	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.07	Very limited Depth to water	1.00

Table 24.--Engineering Properties

(Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
AbA: Abilene-----	In				Pct	Pct					Pct	
	0-9	*Loam	*CL	*A-6, A-4	0	0	98-100	96-100	90-100	60-96	25-35	8-16
	9-37	*Clay, Clay loam, silty clay loam	*CL, CH	*A-7-6, A-6	0	0	98-100	96-100	90-100	75-95	34-58	22-40
	37-80	*Silty clay loam, Clay loam, clay	*CL	*A-7-6, A-6	0	0	90-100	88-100	80-98	60-95	35-50	19-32
AnB: Anocon-----	0-18	*Fine sandy loam	*SC-SM, CL, CL-ML, SC	*A-4	0	0	95-100	95-100	85-100	36-50	17-25	3-10
	18-56	*Clay, Sandy clay, clay loam	*CL, CH, SC	*A-7-6, A-6	0	0	95-100	95-100	90-100	45-85	30-53	15-33
	56-80	*Clay loam, Sandy clay loam	*CL, SC	*A-6, A-4, A- 7-6	0	0	90-100	90-100	85-100	40-85	25-48	8-31
BgB: Bluegrove-----	0-5	*Fine sandy loam	*CL-ML, ML, SC-SM, SM	*A-4, A-6	0	0	100	98-100	70-98	40-65	16-30	NP-14
	5-34	*Clay, Sandy clay, clay loam	*CL, SC	*A-6	0	0-5	95-100	95-100	80-100	45-80	28-50	11-30
	34-60	*Bedrock			---	---	---	---	---	---	---	---
BoB: Bonti-----	0-8	*Fine sandy loam	*SC-SM, CL- ML, ML, SM, SC	*A-4, A-2-4	0	0-5	90-100	90-100	70-100	25-70	0-30	NP-10
	8-26	*Clay, Clay loam, sandy clay	*CL, SC	*A-6	0	0-5	80-100	80-100	70-100	41-75	30-45	15-25
	26-60	*Bedrock			---	---	---	---	---	---	---	---
BpC: Bastrop-----	0-15	*Loamy fine sand	*SM, SC-SM	*A-2-4, A-4	0	0	96-100	96-100	75-95	20-50	16-20	NP-4
	15-45	*Sandy clay loam, Clay loam, loam	*CL, SC	*A-6	0	0	96-100	96-100	75-100	40-70	26-40	11-22
	45-80	*Sandy clay loam, Loam, clay loam	*CL, SC	*A-6	0	0	96-100	75-100	65-100	40-70	26-40	11-22
BsB: Bastrop-----	0-13	*Fine sandy loam	*CL-ML, ML, SC-SM, SM	*A-4	0	0	96-100	96-100	80-100	40-65	18-25	2-7
	13-80	*Sandy clay loam, Clay loam, loam	*CL, SC	*A-6	0	0	96-100	96-100	75-100	40-70	26-40	11-22

Table 24.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
BSc2: Bastrop, eroded-	0-4	*Fine sandy loam	*CL-ML, ML, SC-SM, SM	*A-4	0	0	96-100	96-100	80-100	40-65	18-25	2-7
	4-50	*Sandy clay loam, Clay loam, loam	*CL, SC	*A-6	0	0	96-100	96-100	75-100	40-70	26-40	11-22
	50-80	*Sandy clay loam, Loam, clay loam	*CL, SC	*A-6	0	0	96-100	75-100	65-100	40-70	26-40	11-22
CaC2: Callahan-----	0-5	*Loam	*CL, CL-ML, SC, SC-SM	*A-6, A-4	0	0	90-100	85-100	75-95	45-75	25-35	7-16
	5-34	*Clay, Clay loam	*CL	*A-7-6, A-6	0	0	90-100	90-100	80-100	55-85	35-50	19-30
	34-50	*Clay	*CL, CH	*A-7-6, A-6	0	0	88-100	85-100	75-100	60-95	30-52	15-32
	50-60	*Clay	*CL, CH	*A-7-6, A-6	0	0	88-100	85-100	75-100	60-95	30-52	15-32
	60-64	*Bedrock, Fine sandy loam			0	0	90-100	90-100	75-98	30-50	17-29	3-12
ChB: Chaney-----	0-12	*Loamy fine sand	*SM, SP-SM, SC	*A-2-4, A-3, A-4	0	0	80-100	80-100	65-98	7-45	16-25	NP-5
	12-46	*Clay, Sandy clay	*CL, CH, SC	*A-7-6, A-6	0	0	90-100	90-100	90-100	43-85	39-60	24-42
	46-57	*Clay, Sandy clay, sandy clay loam	*CL, CH, SC	*A-7-6, A-6	0	0	90-100	90-100	80-100	45-85	25-55	11-40
	57-80	*Clay, Sandy clay loam, sandy clay	*CL, CH, SC, SC-SM	*A-7-6, A-2, A-4, A-6	0	0	90-100	90-100	80-100	25-85	25-60	6-40
CkA: Clearfork-----	0-28	*Silty clay loam	*CL	*A-7-6, A-6	0	0	100	100	98-100	85-100	40-58	20-32
	28-80	*Silty clay loam, Silty clay, clay loam	*CL	*A-7-6, A-6	0	0	100	100	95-100	75-100	40-58	20-32
DAM: Dams-----	---	---	---	---	---	---	---	---	---	---	---	---
DeB: Decordova-----	0-14	*Loamy fine sand	*SM, SP-SM	*A-2-4	0	0	95-100	95-100	80-98	10-30	16-22	NP-4
	14-80	*Fine sandy loam, Loam	*SM, SC-SM	*A-2-4, A-4	0	0	95-100	95-100	80-98	15-40	16-25	NP-7
DnB: Deandale-----	0-18	*Loam	*CL, CL-ML	*A-6, A-4	0	0	100	100	95-100	60-95	20-40	5-25
	18-80	*Clay, Clay loam, silty clay	*CL, CH	*A-7-6, A-6	0	0	95-100	95-100	94-100	70-98	35-60	20-40

Table 24.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--					Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200			
In					Pct	Pct						Pct	
EnB: Enterprise-----	0-9	*Very fine sandy loam	*CL, CL-ML, ML	*A-4, A-6	0	0	100	98-100	95-100	65-90	20-32	3-13	
	9-60	*Very fine sandy loam, Loam, silt loam	*CL, CL-ML, ML	*A-4, A-6	0	0	98-100	98-100	95-100	65-90	20-32	3-13	
	60-80	*Very fine sandy loam, Loam, silt loam	*CL, CL-ML, ML	*A-4, A-6	0	0	98-100	98-100	95-100	65-90	20-32	3-13	
EnC: Enterprise-----	0-5	*Very fine sandy loam	*CL, CL-ML, ML	*A-4, A-6	0	0	100	98-100	95-100	65-90	20-32	3-13	
	5-50	*Loam, Very fine sandy loam, silt loam	*CL, CL-ML, ML	*A-4, A-6	0	0	98-100	98-100	95-100	65-90	20-32	3-13	
	50-80	*Very fine sandy loam, Loam, silt loam	*ML, CL, CL- ML	*A-4, A-6	0	0	98-100	98-100	95-100	65-90	20-32	3-13	
ExD: Exray-----	0-5	*Very stony fine sandy loam	*SC, SC-SM	*A-4, A-2-4	5-15	5-23	85-100	80-100	55-80	30-50	20-30	5-10	
	5-12	*Clay loam, Clay, sandy clay	*CL, SC	*A-6	0-5	0-5	85-100	80-100	80-100	48-80	30-45	15-25	
	12-60	*Bedrock			---	---	---	---	---	---	---	---	
Loving-----	0-6	*Very stony fine sandy loam	*SM, CL-ML, ML, SC-SM	*A-4, A-2	5-30	0-15	90-100	88-100	83-100	30-60	0-26	NP-7	
	6-16	*Fine sandy loam, Loam, gravelly fine sandy loam	*SC-SM, CL, ML, SM	*A-4, A-2	0	0-10	70-100	70-100	60-100	25-60	15-30	NP-10	
	16-60	*Bedrock			---	---	---	---	---	---	---	---	
GaB: Gageby-----	0-22	*Loam	*CL, SC	*A-6	0	0	100	96-100	80-98	45-70	23-35	11-20	
	22-58	*Loam, Sandy clay loam, clay loam	*CL, SC	*A-6	0	0	95-100	92-100	90-100	45-80	23-40	11-25	
	58-80	*Loam, Sandy clay loam, clay loam	*CL, SC	*A-6	0	0	95-100	75-100	70-100	45-85	23-40	11-25	
GdF: Goodnight-----	0-18	*Loamy fine sand	*SM, SC	*A-2-4, A-2	0	0	100	98-100	90-100	15-35	0-14	NP	
	18-40	*Fine sand, Loamy fine sand	*SM, SP-SM, SC	*A-2-4, A-2, A-3	0	0	100	98-100	82-100	5-35	0-14	NP	
	40-80	*Fine sand, Loamy fine sand	*SM, SP-SM, SC	*A-2-4, A-2, A-3	0	0	100	98-100	82-100	5-35	0-14	NP	

Table 24.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
GeA: Cowen-----	0-30	*Loam	*CL	*A-6	0	0	100	96-100	80-98	50-80	25-40	11-24
	30-80	*Sandy clay loam, Clay loam, loam	*CL	*A-6, A-7-6	0	0	100	96-100	80-100	55-85	25-45	11-28
GfB: Grandfield-----	0-8	*Loamy fine sand	*SM, SC	*A-2-4, A-2	0	0	100	98-100	90-100	15-35	0-14	NP
	8-40	*Sandy clay loam, Fine sandy loam	*CL, ML, SC, SM	*A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	40-56	*Sandy clay loam, Fine sandy loam	*CL, ML, SC, SM	*A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	56-80	*Fine sandy loam, Sandy clay loam	*SC-SM, CL, ML, SC, SM	*A-4	0	0	100	98-100	90-100	36-60	15-30	NP-10
GnB: Grandfield-----	0-5	*Fine sandy loam	*SM, CL-ML, ML, SC-SM, SC	*A-4	0	0	100	98-100	94-100	36-60	15-26	NP-7
	5-28	*Sandy clay loam, Fine sandy loam	*CL, ML, SC, SM	*A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	28-41	*Sandy clay loam, Fine sandy loam	*CL, ML, SC, SM	*A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	41-80	*Fine sandy loam, Sandy clay loam	*SC-SM, CL, ML, SC, SM	*A-4	0	0	100	98-100	90-100	36-60	15-30	NP-10
GnC: Grandfield-----	0-5	*Fine sandy loam	*SM, CL-ML, ML, SC-SM, SC	*A-4	0	0	100	98-100	94-100	36-60	15-26	NP-7
	5-18	*Sandy clay loam, Fine sandy loam	*CL, ML, SC, SM	*A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	18-56	*Sandy clay loam, Fine sandy loam	*CL, ML, SC, SM	*A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	56-80	*Sandy clay loam, Fine sandy loam	*SC-SM, CL, ML, SC, SM	*A-4	0	0	100	98-100	90-100	36-60	15-30	NP-10
GrB: Grandmore-----	0-18	*Fine sandy loam	*SM, CL-ML, ML, SC-SM, SC	*A-4	0	0	100	98-100	94-100	36-60	15-26	NP-7
	18-38	*Sandy clay loam, Fine sandy loam	*CL, ML, SC, SM	*A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16
	38-59	*Clay loam, Clay	*CL, CH	*A-7-6, A-6	0	0	100	100	96-100	80-95	31-60	11-34
	59-80	*Fine sandy loam, Sandy clay loam	*CL, SC	A-4, A-6	0	0	98-100	95-100	75-98	36-65	20-35	8-22

Table 24.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
In					Pct	Pct					Pct	
HeC: Heaton-----	0-32	*Fine sand	*SM, SC	*A-2-4	0	0	95-100	95-100	70-90	15-30	16-20	NP-3
	32-61	*Sandy clay loam	*CL, SC	*A-6, A-4	0	0	98-100	95-100	75-95	36-65	20-35	8-22
	61-80	*Fine sandy loam, Sandy clay loam	*CL, SC	*A-6, A-4	0	0	98-100	95-100	75-98	36-65	20-35	8-22
HnB: Hensley-----	0-4	*Loam	*CL, CL-ML	*A-4, A-6	0	0-2	80-100	75-100	70-100	60-85	20-35	5-16
	4-14	*Clay, Clay loam	*CL, CH	*A-7-6, A-6	0	0-10	80-100	75-100	70-100	60-90	35-55	18-35
	14-20	*Bedrock			---	---	---	---	---	---	---	---
HsB: Hensley-----	0-5	*Stony loam	*CL, CL-ML	*A-6, A-4	1-27	5-15	88-100	83-100	70-100	60-90	20-40	5-20
	5-14	*Clay, Clay loam	*CL, CH	*A-7-6, A-6	0-2	0-10	80-100	75-100	70-100	65-95	35-55	18-35
	14-19	*Bedrock			---	---	---	---	---	---	---	---
JaB: Jacksboro-----	0-4	*Fine sandy loam	*SC-SM, SC, SM	*A-4	0	0-1	86-98	75-95	60-80	35-50	18-26	2-10
	4-11	*Very gravelly fine sandy loam, Gravelly fine sandy loam	*SC, GC, GM, SC-SM	*A-2-4, A-1, A-2-6	0	0-5	30-75	25-70	20-60	15-35	16-33	3-17
	11-18	*Very gravelly clay, Very gravelly clay loam	*GC, SC	*A-2-7, A-7-6	0	0-5	25-70	25-50	25-50	20-40	41-60	23-40
JrE: Jolly-----	18-25	*Bedrock			---	---	---	---	---	---	---	---
	0-4	*Fine sandy loam	*SC-SM, CL, CL-ML, SC	*A-4,	0	0	95-100	90-100	80-100	35-60	20-30	4-9
	4-12	*Sandy clay loam	*SC, CL	*A-6, A-2-6	0-2	0	95-100	90-100	80-100	30-55	28-40	10-20
Rock outcrop----	12-60	*Bedrock, Fine sandy loam			0	0	90-100	90-100	75-98	30-50	---	---
	0-80	*Bedrock			---	---	---	---	---	---	---	---
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KaA: Kamay-----	0-12	*Silt loam	*CL, CL-ML	*A-6, A-4	0	0	100	100	90-100	60-90	20-40	5-20
	12-52	*Clay, Clay loam	*CL, CH	*A-7-6, A-6	0	0	95-100	95-100	90-100	70-98	35-60	18-40
	52-73	*Silty clay loam, Clay, clay loam	*CL, CH	*A-7-6, A-6	0	0	95-100	95-100	90-100	70-98	35-60	18-40
KvE: Knoco-----	73-80	*			---	---	---	---	---	---	---	---
	0-5	*Clay	*CL, CH	*A-7-6, A-6	2-5	5-10	90-100	85-100	85-100	80-98	30-60	12-38
	5-13	*Clay, Silty clay	*CL, CH	*A-7-6, A-6	0	0-2	90-100	85-100	70-100	70-100	30-60	12-38
	13-80	*Clay, Silty clay	*CL, CH	*A-7-6, A-6	0	0-2	90-100	85-100	70-100	70-100	30-60	12-38

Table 24.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Vernon	0-3	*Clay	*CL, CH	*A-7-6, A-6	0-10	0-20	90-100	90-100	85-100	80-98	38-60	20-38
	3-25	*Clay, Silty clay	*CL, CH	*A-7-6, A-6	0	0	95-100	95-100	80-100	80-98	32-60	20-40
	25-53	*Clay, Silty clay	*CL, CH	*A-7-6, A-6	0	0-5	90-100	85-100	75-100	65-95	30-60	15-38
	53-80	*Clay, Silty clay	*CL, CH	*A-7-6, A-6	0	0-5	90-100	85-100	65-100	65-96	30-60	15-38
KvG: Knoco	0-3	*Clay	*CL, CH	*A-7-6, A-6	2-5	5-10	90-100	85-100	85-100	80-98	30-60	12-38
	3-9	*Clay, Silty clay	*CL, CH	*A-7-6, A-6	0	0-2	90-100	85-100	70-100	70-100	30-60	12-38
	9-80	*Clay, Silty clay	*CL, CH	*A-7-6, A-6	0	0-2	90-100	85-100	70-100	70-100	30-60	12-38
	0-3	*Clay	*CL, CH	*A-7-6, A-6	0-10	0-20	90-100	90-100	85-100	80-98	38-60	20-38
Vernon	3-20	*Clay, Silty clay	*CL, CH	*A-7-6, A-6	0	0	95-100	95-100	80-100	80-98	32-60	20-40
	20-60	*Clay, Silty clay	*CL, CH	*A-7-6, A-6	0	0-5	90-100	85-100	75-100	65-95	30-60	15-38
	60-80	*Clay, Silty clay	*CL, CH	*A-7-6, A-6	0	0-5	90-100	85-100	65-100	65-96	30-60	15-38
	0-20	*Clay	*CH, CL	*A-7-6	0	0-5	97-100	96-100	85-100	75-95	45-65	30-42
LeB: Leeray	20-42	*Clay, Silty clay	*CH, CL	*A-7-6	0	0-5	97-100	96-100	85-100	75-95	45-65	30-42
	42-54	*Clay, Silty clay	*CH	*A-7-6	0	0-5	95-100	95-100	85-100	75-95	51-70	30-45
	54-80	*Clay, Silty clay loam, silty clay	*CH, CL	*A-7-6	0	0-5	95-100	95-100	85-100	70-95	44-57	30-40
	0-6	*Sandy loam	*SM, CL-ML, ML, SC-SM, SC	*A-4	0	0	95-100	85-100	80-100	36-60	15-24	NP-7
LnA: Lincoln	6-80	*Fine sand	*SC-SM, SM, SP-SM	*A-2-4, A-2, A-3	0	0	95-100	85-100	82-100	5-35	0-34	NP-10
	0-7	*Silt loam	*CL, CL-ML	*A-6, A-4	0	0-3	95-100	90-100	80-100	65-90	20-40	5-20
LyB: Lindy	7-32	*Clay, Clay loam	*CL, CH	*A-7-6, A-6	0	0-3	95-100	95-100	90-100	65-90	35-60	15-35
	32-60	*Bedrock			---	---	---	---	---	---	---	---
MwB: Minwells	0-9	*Fine sandy loam	*SC, SC-SM, CL, CL-ML	*A-4, A-2, A- 6	0	0	96-100	90-100	80-98	30-60	0-30	NP-15
	9-68	*Clay, Clay loam, sandy clay	*CL,	*A-7-6, A-6	0	0	95-100	90-100	85-98	50-80	32-50	15-32
	68-80	*Very gravelly sand, Very gravelly sandy loam, gravelly sandy clay loam	*GC, GM, GP- GM, SC, SP- SM	*A-2-6, A-1	0	0-5	15-75	10-60	5-50	5-30	0-44	NP-28

Table 24.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
NCB: Newcastle-----	In				Pct	Pct					Pct	
	0-11	*Loamy fine sand	*SC-SM, SM, SP-SM, SC	*A-2-4, A-2	0	0-13	83-100	66-100	59-99	16-35	18-32	2-10
	11-37	*Sandy clay loam, Fine sandy loam, clay loam	*SC, CL, CL- ML, SC-SM	*A-6	0	0	90-100	73-100	57-95	31-59	28-45	12-25
	37-60	*Bedrock			0	0	100	100	---	---	---	---
NEB: Newcastle-----	0-7	*Fine sandy loam	*SC-SM, SC, SM	*A-4, A-2-4	0	0	90-100	90-100	75-98	30-50	17-25	3-8
	7-28	*Sandy clay loam, Fine sandy loam, clay loam	*CL, CL-ML, SC, SC-SM	*A-6, A-4	0	0	90-100	80-100	65-100	40-65	20-40	7-22
	28-60	*Fine sandy loam, Bedrock			0	0	90-100	90-100	75-98	30-50	---	---
NoC: Newcastle-----	0-4	*Fine sandy loam	*SC-SM, SC, SM	*A-4, A-2-4	0	0	90-100	90-100	75-98	30-50	17-25	3-8
	4-33	*Sandy clay loam, Fine sandy loam, clay loam	*CL, CL-ML, SC, SC-SM	*A-6, A-4	0	0	90-100	80-100	65-100	40-65	20-40	7-22
	33-60	*Bedrock, Fine sandy loam			0	0	90-100	90-100	75-98	30-50	---	---
Jolly-----	0-7	*Fine sandy loam	*SC-SM, CL, CL-ML, SC	*A-4	0	0	95-100	90-100	80-100	35-60	20-30	4-9
	7-15	*Sandy clay loam	*SC, CL	*A-6, A-2-6	0-2	0	95-100	90-100	80-100	30-55	28-40	10-20
	15-19	*Gravelly fine sandy loam, Fine sandy loam, sandy clay loam	*SC, SC-SM	*A-6, A-2-6	0-2	0-3	91-100	69-100	65-100	20-50	28-40	10-20
	19-60	*Fine sandy loam, Bedrock			0	0	90-100	90-100	75-98	30-50	---	---
NuA: Nukrum-----	0-13	*Clay loam	*CH, CL	*A-7-6	0	0	95-100	90-100	90-100	75-85	41-60	21-35
	13-51	*Clay, Silty clay, clay loam	*CH, CL	*A-7-6	0	0	95-100	90-100	90-100	70-95	45-68	27-45
	51-80	*Silty clay loam, Silty clay, clay loam	*CH, CL	*A-7-6	0	0	85-100	75-100	70-95	65-95	41-60	25-40

Table 24.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
OhG: Owens-----	In				Pct	Pct					Pct	
	0-6	*Clay	*CH, CL	*A-7-6	0	0-5	95-100	95-100	85-100	75-95	45-60	22-32
	6-19	*Clay, Clay loam, silty clay	*CH, CL	*A-7-6	0-5	0-10	80-100	80-100	80-100	75-95	45-60	22-33
	19-60	*Clay, Silty clay	*CH, CL	*A-7-6	0-5	0-10	90-100	85-100	80-100	65-95	45-60	25-37
Harpersville----	0-8	*Clay	*CH, CL	*A-7-6	0	0-5	95-100	95-100	85-100	75-95	45-60	22-32
	8-60	*Clay	*CH, CL	*A-7-6	---	0-10	90-100	85-100	80-100	65-95	45-60	22-32
OnE: Owens-----	0-4	*Clay	*CH, CL	*A-7-6	0	0-5	95-100	95-100	85-100	75-95	45-60	22-32
	4-17	*Clay, Clay loam, silty clay	*CH, CL	*A-7-6	0-5	0-10	80-100	80-100	80-100	75-95	45-60	22-33
	17-60	*Clay, Silty clay	*CH, CL	*A-7-6	0-5	0-10	90-100	85-100	80-100	65-95	45-60	25-37
Ow: Oil-waste land--	0-80	*Variable			---	---	---	---	---	---	---	---
PaA: Padgett-----	0-9	*Clay	*CH, CL	*A-7-6	0	0	100	100	98-100	90-100	52-77	29-46
	9-66	*Clay, Silty clay	*CH, CL	*A-7-6	0	0	100	100	95-100	90-100	51-71	29-44
	66-80	*Clay, Clay loam, silty clay, silty clay loam	*CH, CL	*A-7-6	0	0	100	100	95-100	90-100	41-70	21-44
PaD: Palopinto-----	0-7	*Stony loam	*CL, CH	*A-7-6, A-6	15-35	10-24	85-100	85-100	75-100	70-95	39-58	17-31
	7-11	*Extremely stony loam, Extremely stony clay loam, extremely stony silty clay loam	*CL, CH	*A-7-6, A-6	5-15	50-85	65-100	65-100	60-100	51-95	39-58	17-31
	11-60	*Bedrock			---	---	---	---	---	---	---	---
QU: Pits, quarry----	---	---	---	---	---	---	---	---	---	---	---	---
RwB: Rowden-----	0-13	*Clay loam	*CL	*A-6, A-7-6	0	0-5	90-100	75-100	70-100	60-80	32-46	12-23
	13-35	*Clay, Clay loam	*CH, CL	*A-7-6	0	0-5	85-100	75-100	75-100	60-80	41-60	20-35
	35-60	*Bedrock			---	---	---	---	---	---	---	---
SaA: Sagerton-----	0-13	*Loam	*CL	*A-6, A-4	0	0	95-100	95-100	90-100	55-80	25-35	8-18
	13-34	*Clay loam, Clay	*CL	*A-7-6, A-6	0	0	95-100	95-100	90-100	65-95	36-50	18-30
	34-80	*Clay loam, Silty clay loam, clay	*CL	*A-6, A-4, A- 7-6	0	0	90-100	90-100	80-100	60-85	25-50	8-30

Table 24.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
SaB: Sagerton-----	0-9	*Loam		*A-6, A-4	0	0	95-100	95-100	90-100	55-80	25-35	8-18
	9-41	*Clay loam, Clay		*A-7-6, A-6	0	0	95-100	95-100	90-100	65-95	36-50	18-30
	41-80	*Silty clay loam, Clay Toam, clay		*A-6, A-4, A- 7-6	0	0	90-100	90-100	80-100	60-85	25-50	8-30
ScB: Springcreek-----	0-8	*Loam										
	8-24	*Gravelly clay loam, Gravelly loam, very gravelly loam	*CL, CH *SC, GC, GC- GM, SC-SM	*A-7-6, A-6 *A-6, A-2, A- 4, A-7-6	0 0	0-3 0-5	80-100 50-85	80-100 35-80	65-96 20-60	55-84 15-60	35-55 24-47	15-30 5-22
	24-40	*Bedrock			---	---	---	---	---	---	---	---
SeB: Set-----	0-13	*Clay loam			0-1	0-5	95-100	95-100	80-100	75-95	36-55	20-36
	13-52	*Silty clay loam, Clay, silty clay	*CL, CH *CL, CH	*A-7-6, A-6 *A-7-6, A-6	0-1 0-1	0-5 0-5	90-100	85-100	80-100	75-95	33-60	20-40
	52-80	*Clay, Silty clay	*CH, CL	*A-7-6	0-5	0-10	90-100	85-100	80-100	65-95	45-60	25-37
SpG: Set-----	0-12	*Stony clay loam			5-14	5-14	95-100	90-100	80-100	75-95	36-55	20-36
	12-44	*Clay, Silty clay, silty clay loam	*CL, CH *CL, CH	*A-7-6, A-6 *A-7-6, A-6	0-1 0-1	0-5 0-5	90-100	85-100	80-100	75-95	33-60	20-40
	44-60	*Clay, Silty clay	*CH, CL	*A-7-6	0-5	0-10	90-100	85-100	80-100	65-95	45-60	25-37
Palopinto-----	0-4	*Very stony loam			1-27	5-15	88-100	83-100	75-100	70-95	39-58	17-31
	4-13	*Extremely stony loam, Extremely stony clay loam, extremely stony silty clay loam	*CL, CH *CL, CH	*A-7-6, A-6 *A-7-6, A-6	30-55	50-85	65-100	65-100	60-100	51-95	39-58	17-31
	13-60	*Bedrock			---	---	---	---	---	---	---	---
StF: Shatruce-----	0-9	*Gravelly fine sandy Toam	*SC-SM, SM, SC	*A-2-4	5-20	0-5	70-85	46-77	40-60	25-35	15-25	2-7
	9-26	*Clay, Sandy clay, clay Toam	*CL	*A-7-6, A-6	0-5	0-5	80-100	80-100	80-100	51-80	36-47	25-35
	26-60	*Clay	*CL	*A-6, A-7-6	0-5	0-5	80-100	80-100	80-100	51-80	31-45	20-30
StG: Shatruce-----	0-9	*Gravelly fine sandy Toam	*SC-SM, SM, SC	*A-2-4	0-5	0-5	55-80	50-75	40-60	25-35	15-25	2-7
	9-34	*Clay, Sandy clay, clay Toam	*CL	*A-7-6, A-6	0-5	0-5	80-100	80-100	80-100	51-80	36-47	25-35
	34-60	*Clay	*CL	*A-6, A-7-6	0-5	0-5	80-100	80-100	80-100	51-80	31-45	20-30

Table 24.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index	
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200			
ThB: Thurber-----	In				Pct	Pct					Pct		
	0-8	*Clay loam	*CL	*A-6, A-4	0	0		98-100	96-100	90-100	60-90	25-40	8-20
	8-61	*Clay, Clay loam	*CH, CL	*A-7-6, A-6	0	0		98-100	96-100	90-100	70-95	37-65	22-45
	61-80	*Clay, Clay loam, sandy clay loam	*CL	*A-7-6, A-6	0	0		95-100	85-100	75-100	50-85	35-50	20-35
TKC: Throck-----													
	0-4	*Silty clay loam	*CL	*A-7-6	0	0-1		82-100	65-100	61-100	54-94	42-55	21-29
	4-40	*Clay, Silty clay, silty clay loam	*CH, CL	*A-7-6	0	0-1		84-100	63-100	50-100	43-92	46-70	25-44
	40-48	*Clay, Silty clay	*CH, CL	*A-7-6	0	0		95-100	90-100	74-100	64-91	50-70	29-44
	48-80	*Clay, Silty clay, channery clay	*CH, CL	*A-7-6, A-6	0	0		96-100	91-100	69-100	54-94	38-70	18-44
TmB: Tillman-----													
	0-7	*Clay loam	*CL	*A-6	0	0		100	100	98-100	70-90	25-40	11-23
	7-22	*Clay, Clay loam	*CL, CH	*A-7-6, A-6	0	0		98-100	93-100	90-98	70-95	38-60	20-38
	22-36	*Clay, Clay loam	*CL, CH	*A-7-6, A-6	0	0		98-100	93-100	90-98	70-95	38-60	20-38
	36-62	*Clay, Clay loam	*CL, CH	*A-7-6, A-6	0	0-5		95-100	90-100	80-97	60-90	28-55	13-35
	62-80	*Clay, Clay loam	*CL, CH	*A-7-6, A-6	0	0-5		95-100	90-100	80-97	60-90	28-55	13-35
TrB: Truce-----													
	0-5	*Fine sandy loam	*CL-ML, SC, SC-SM, SM, ML	*A-4	0	0		95-100	90-100	75-100	40-70	20-30	3-10
	5-56	*Clay, Sandy clay, clay loam	*CL, CH	*A-7-6, A-6	0	0		90-100	90-100	75-100	55-85	35-52	18-32
	56-80	*Clay	*CL, CH	*A-7-6, A-6	0	0		88-100	85-100	75-100	60-95	30-52	15-32
TrC: Truce-----													
	0-4	*Fine sandy loam	*CL-ML, SC, SC-SM, SM, ML	*A-4	0	0		95-100	90-100	75-100	40-70	20-30	3-10
	4-44	*Clay, Sandy clay, clay loam	*CL, CH	*A-7-6, A-6	0	0		90-100	90-100	75-100	55-85	35-52	18-32
	44-80	*Clay, Very shaly clay	*CL, CH	*A-7-6, A-6	0	0		88-100	85-100	75-100	60-95	30-52	15-32
VeC: Vernon-----													
	0-6	*Clay	*CL, CH	*A-7-6, A-6	0	0		95-100	90-100	90-100	80-98	38-60	20-38
	6-28	*Clay, Silty clay	*CL, CH	*A-7-6, A-6	0	0		95-100	90-100	90-100	80-98	38-60	20-40
	28-60	*Clay, Silty clay	*CL, CH	*A-7-6, A-6	0	0-5		90-100	85-100	65-100	65-96	30-60	15-38
W: Water-----	---	---	---	---	---	---	---	---	---	---	---	---	---

Table 24.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
WbA: Westola-----	0-8	*Fine sandy loam, Loam	*SM, CL-ML, ML, SC-SM, SC	*A-4	0	0	100	95-100	90-100	36-60	15-26	NP-7
	8-21	*Very fine sandy loam, Fine sandy loam, loam	*CL-ML, CL, ML, SC, SM	*A-4	0	0	100	95-100	90-100	36-85	15-30	NP-10
	21-55	*Fine sandy loam	*CL-ML, CL, ML, SC, SM	*A-4, A-2	0	0	100	95-100	90-100	15-85	15-30	NP-10
	55-80	*Loam	*CL-ML, CL, ML, SC, SM	*A-4, A-2	0	0	100	95-100	90-100	15-85	15-30	NP-10
WdB: Weswind-----	0-11	*Fine sandy loam	*ML, CL-ML, SC-SM, SM	*A-4	0	0	98-100	95-100	70-90	35-65	0-25	NP-7
	11-25	*Clay, Clay loam, sandy clay	*CL, CH	*A-7-6, A-6	0	0	95-100	90-100	80-100	65-95	35-54	20-36
	25-67	*Clay, Clay loam, sandy clay	*CL, CH	*A-7-6, A-6	0	0	95-100	85-100	80-100	60-85	30-52	14-32
	67-80	*Clay	*CL, CH	*A-7-6	0	0	95-100	95-100	80-100	70-99	41-54	23-36
WbA: Wheatwood-----	0-14	*Loam	*CL, CL-ML	*A-6, A-4	0	0	100	98-100	90-100	65-95	20-35	5-18
	14-51	*Clay loam, Silt loam, silty clay loam	*CL, CL-ML	*A-6, A-4	0	0	100	98-100	95-100	70-98	20-40	5-22
	51-80	*Silt loam	*CL, CL-ML	*A-6, A-4	0	0	100	98-100	90-100	55-95	20-35	5-18
WbB: Wichita-----	0-5	*Clay loam	*CL	*A-6	0	0	98-100	96-100	90-100	70-90	28-40	11-20
	5-21	*Clay loam, Clay, silty clay	*CL	*A-7-6, A-6	0	0	98-100	96-100	90-100	70-98	36-50	20-30
	21-80	*Clay loam, Clay, silty clay	*CL	*A-6, A-7-6	0	0	96-100	90-100	80-100	65-95	30-50	15-30
WtB: Winters-----	0-10	*Loam	*CL, CL-ML	*A-4, A-6	0	0	98-100	95-100	75-100	51-85	24-35	6-15
	10-50	*Clay loam, Sandy clay, clay	*CL, CH	*A-7-6	0	0	95-100	90-100	80-100	60-90	41-52	20-30
	50-80	*Clay loam, Sandy clay loam, sandy clay	*CL, CH	*A-6, A-7-6	0	0	95-100	90-100	80-100	51-87	27-52	14-33

Table 25.--Physical Soil Properties

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility index
								Kw	Kf	T	
	In	Pct	g/cc	In/hr	In/in	Pct	Pct				
AbA: Abilene-----	0-9	20-27	1.30-1.65	0.6-2	0.15-0.20	3.0-5.9	1.0-3.0	.37	.37	5	48
	9-37	35-45	1.30-1.60	0.2-0.6	0.14-0.18	3.0-5.9	1.0-2.0	.28	.28		
	37-80	22-45	1.40-1.60	0.2-0.6	0.12-0.15	3.0-5.9	0.1-1.0	.32	.32		
AnB: Anocon-----	0-18	10-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	1.0-3.0	.28	.28	5	86
	18-56	35-50	1.30-1.60	0.2-0.6	0.12-0.15	3.0-5.9	0.5-1.0	.32	.32		
	56-80	25-40	1.30-1.60	0.2-0.6	0.12-0.15	3.0-5.9	0.0-0.5	.32	.32		
BgB: Bluegrove-----	0-5	10-20	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.5-3.0	.32	.32	3	86
	5-34	35-55	1.35-1.60	0.2-0.6	0.15-0.20	3.0-5.9	0.5-2.0	.32	.32		
	34-60	---	---	0.2-2	---	---	---	---	---		
BoB: Bontj-----	0-8	10-20	1.35-1.60	0.6-2	0.10-0.15	0.0-2.9	0.1-2.0	.37	.37	2	86
	8-26	35-56	1.35-1.60	0.2-0.6	0.11-0.20	3.0-5.9	0.1-0.5	.32	.32		
	26-60	---	---	0.2-2	---	---	---	---	---		
BpC: Bastrop-----	0-15	3-12	1.55-1.65	2-6	0.07-0.11	0.0-2.9	0.5-1.0	.28	.28	5	134
	15-45	20-35	1.55-1.65	0.6-2	0.15-0.19	0.0-2.9	0.3-1.0	.32	.32		
	45-80	18-39	1.55-1.70	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.32	.32		
BsB: Bastrop-----	0-13	5-20	1.50-1.65	2-6	0.11-0.17	0.0-2.9	0.5-1.0	.37	.37	5	86
	13-80	20-35	1.55-1.65	0.6-2	0.15-0.19	0.0-2.9	0.3-1.0	.32	.32		
BsC2: Bastrop, eroded----	0-4	5-20	1.50-1.65	2-6	0.11-0.17	0.0-2.9	0.5-1.0	.37	.37	5	86
	4-50	20-35	1.55-1.65	0.6-2	0.15-0.19	0.0-2.9	0.3-1.0	.32	.32		
	50-80	18-39	1.55-1.70	0.6-2	0.12-0.16	0.0-2.9	0.1-0.5	.32	.32		
CaC2: Callahan-----	0-5	15-27	1.35-1.50	0.2-0.6	0.15-0.20	0.0-2.9	0.5-1.0	.32	.32	3	48
	5-34	35-50	1.40-1.55	0.06-0.2	0.12-0.18	3.0-5.9	0.5-1.0	.32	.32		
	34-50	35-55	1.60-1.80	0.00-0.06	0.05-0.09	3.0-5.9	0.5-1.0	.28	.28		
	50-60	35-55	1.60-1.80	0.00-0.06	0.05-0.09	3.0-5.9	0.5-1.0	.28	.28		

Table 25.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
ChB: Chaney-----	0-12	5-15	1.78-1.87	2-6	0.05-0.10	0.0-2.9	0.1-1.0	.20	.24	5	2	134
	12-46	35-50	1.40-1.65	0.06-0.2	0.12-0.16	3.0-5.9	0.1-1.0	.28	.28			
	46-57	20-45	1.54-1.82	0.06-0.2	0.15-0.18	3.0-5.9	0.1-1.0	.28	.28			
	57-80	20-45	1.70-1.90	0.00-0.06	0.10-0.13	3.0-5.9	0.1-1.0	.28	.28			
CkA: Clearfork-----	0-28	30-45	1.35-1.55	0.2-0.6	0.07-0.14	3.0-5.5	1.0-5.0	.32	.32	5	4	86
	28-80	27-45	1.45-1.65	0.2-0.6	0.07-0.14	3.0-5.5	0.2-1.0	.32	.32			
DAM: Dams-----	---	---	---	---	---	---	---	---	---	---	---	---
DeB: Decordova-----	0-14	5-12	1.40-1.60	2-6	0.07-0.11	0.0-2.9	0.2-1.0	.17	.20	5	2	134
	14-80	6-17	1.40-1.65	2-6	0.10-0.16	0.0-2.9	0.2-1.0	.24	.24			
DnB: Deandale-----	0-18	15-30	1.30-1.50	0.6-2	0.15-0.20	2.0-5.9	1.0-3.0	.43	.43	5	6	48
	18-80	35-45	1.35-1.55	0.00-0.06	0.12-0.18	4.0-9.2	0.5-1.0	.32	.32			
EnB: Enterprise-----	0-9	7-18	1.35-1.55	2-6	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43	5	3	86
	9-60	7-18	1.35-1.55	2-6	0.15-0.20	0.0-2.9	0.1-0.5	.43	.43			
	60-80	7-18	1.35-1.55	2-6	0.15-0.20	0.0-2.9	0.1-0.5	.43	.43			
EnC: Enterprise-----	0-5	7-18	1.35-1.55	2-6	0.15-0.20	0.0-2.9	0.5-1.0	.43	.43	5	3	86
	5-50	7-18	1.35-1.55	2-6	0.15-0.20	0.0-2.9	0.1-0.5	.43	.43			
	50-80	7-18	1.35-1.55	2-6	0.15-0.20	0.0-2.9	0.1-0.5	.43	.43			
ExD: Exray-----	0-5	7-20	1.40-1.60	0.6-2	0.07-0.12	0.0-2.9	0.5-1.0	.15	.28	1	8	0
	5-12	35-50	1.40-1.60	0.2-0.6	0.12-0.20	3.0-5.9	0.0-0.5	.32	.32			
	12-60	---	---	0.2-2	---	---	0.0-0.5	---	---			
Loving-----	0-6	10-20	1.30-1.65	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.15	.20	2	3	0
	6-16	10-25	1.40-1.70	2-6	0.12-0.16	0.0-2.9	0.0-0.5	.20	.24			
	16-60	---	1.85-2.00	0.06-0.2	---	---	---	---	---			

Table 25.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
GaB: Gageby-----	0-22	18-27	1.40-1.55	0.6-2	0.16-0.20	3.0-5.9	1.0-3.0	.28	.28	5	5	56
	22-58	18-35	1.40-1.55	0.6-2	0.16-0.20	3.0-5.9	0.5-2.0	.28	.28			
	58-80	18-35	1.45-1.60	0.6-2	0.16-0.20	3.0-5.9	0.5-2.0	.28	.28			
GdF: Goodnight-----	0-18	5-12	1.35-1.50	6-20	0.05-0.11	0.0-2.9	0.5-1.0	.17	.17	5	2	134
	18-40	2-12	1.50-1.70	6-20	0.02-0.11	0.0-2.9	0.5-1.0	.15	.15			
	40-80	2-12	1.50-1.70	6-20	0.02-0.11	0.0-2.9	0.5-1.0	.15	.15			
GeA: Gowen-----	0-30	18-30	1.40-1.55	0.6-2	0.15-0.20	3.0-5.9	1.0-4.0	.28	.28	5	5	56
	30-80	20-35	1.40-1.60	0.6-2	0.15-0.20	3.0-5.9	0.2-2.0	.28	.28			
GfB: Grandfield-----	0-8	5-10	1.35-1.50	2-6	0.07-0.11	0.0-2.9	0.5-1.0	.20	.20	5	2	134
	8-40	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	40-56	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	56-80	10-25	1.50-1.70	2-6	0.11-0.15	0.0-2.9	0.0-0.5	.28	.28			
GnB: Grandfield-----	0-5	10-18	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	5-28	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	28-41	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	41-80	10-25	1.50-1.70	2-6	0.11-0.15	0.0-2.9	0.0-0.5	.28	.28			
GnC: Grandfield-----	0-5	10-18	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	5-18	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	18-56	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.3-0.7	.32	.32			
	56-80	10-25	1.50-1.70	2-6	0.11-0.15	0.0-2.9	0.0-0.5	.28	.28			
GrB: Grandmore-----	0-18	10-18	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.24	.24	5	3	86
	18-38	18-30	1.50-1.70	0.6-2	0.11-0.17	0.0-2.9	0.5-1.0	.32	.32			
	38-59	30-45	1.35-1.65	0.2-0.6	0.12-0.20	3.0-5.9	0.0-0.4	.32	.32			
HeC: Heaton-----	0-32	1-5	1.20-1.40	2-6	0.05-0.10	0.0-2.9	0.5-1.0	.17	.17	5	1	250
	32-57	20-35	1.30-1.65	0.6-2	0.10-0.15	0.0-2.9	0.1-0.5	.24	.24			
	57-80	10-30	1.45-1.70	0.6-2	0.10-0.15	0.0-2.9	0.1-0.5	.24	.24			

Table 25.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
HnB: Hensley-----	0-4	15-30	1.30-1.50	0.2-0.6	0.13-0.20	0.0-2.9	0.5-2.0	.37	.37	1	6	48
	4-14	35-55	1.25-1.45	0.06-0.2	0.12-0.20	3.0-5.9	0.0-0.5	.32	.32			
	14-20	---	---	0.06-2	---	---	---	---	---			
HsB: Hensley-----	0-5	15-30	1.35-1.55	0.2-0.6	0.13-0.20	0.0-2.9	0.5-2.0	.10	.32	1	8	0
	5-14	35-55	1.40-1.65	0.06-0.2	0.12-0.20	3.0-5.9	0.1-1.0	.32	.43			
	14-19	---	---	0.06-2	---	---	---	---	---			
JaB: Jacksboro-----	0-4	10-20	1.40-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.24	.28	1	3	86
	4-11	10-20	1.40-1.65	2-6	0.06-0.10	0.0-2.9	0.5-1.0	.10	.28			
	11-18	35-45	1.40-1.60	0.2-0.6	0.07-0.11	3.0-5.9	0.5-1.0	.10	.32			
	18-25	---	---	0.2-2	---	---	---	---	---			
JrE: Jolly-----	0-4	8-18	1.40-1.55	2-6	0.10-0.14	0.0-2.9	0.5-1.6	.28	.28	2	3	86
	4-12	20-35	1.50-1.65	0.6-2	0.12-0.16	0.0-2.9	0.1-1.0	.32	.32			
	12-60	6-18	1.50-1.65	0.06-0.2	0.01-0.03	0.0-2.9	0.0-0.1	.28	.28			
Rock outcrop-----	0-80	---	---	0.06-20	---	---	---	---	---	-	---	---
KaA: Kamay-----	0-12	15-27	1.40-1.60	0.6-2	0.10-0.16	0.0-2.9	1.0-3.0	.37	.37	5	5	56
	12-52	35-50	1.40-1.60	0.00-0.06	0.10-0.16	6.0-8.9	0.5-2.0	.32	.32			
	52-80	35-45	1.40-1.75	0.06-0.2	0.10-0.16	6.0-8.9	0.0-0.5	.32	.32			
KvE: Knoco-----	0-5	40-60	1.25-1.45	0.00-0.06	0.10-0.17	1.0-4.0	0.5-1.0	.32	.32	1	8	0
	5-13	40-60	1.45-1.90	0.00-0.06	0.03-0.10	1.0-4.0	0.0-0.5	.32	.32			
	13-80	40-60	1.70-2.25	0.00-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			
Vernon-----	0-3	40-60	1.40-1.60	0.00-0.06	0.06-0.15	6.0-8.9	0.5-2.0	.32	.32	3	8	0
	3-25	40-60	1.45-1.65	0.00-0.06	0.10-0.15	6.0-8.9	0.5-1.0	.37	.37			
	25-53	40-60	1.60-1.75	0.00-0.06	0.06-0.10	6.0-8.9	0.5-1.0	.37	.37			
	53-80	40-60	1.70-2.25	0.00-0.06	0.02-0.05	6.0-8.9	0.5-1.0	.32	.32			

Table 25.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
KvG: Knoco-----	0-3	40-60	1.25-1.45	0.00-0.06	0.10-0.17	1.0-4.0	0.5-1.0	.32	.32	1	5	56
	3-9	40-60	1.45-1.90	0.00-0.06	0.03-0.10	1.0-4.0	0.0-0.5	.32	.32			
	9-80	40-60	1.70-2.25	0.00-0.06	0.01-0.03	1.0-4.0	0.0-0.3	.32	.32			
Vernon-----	0-3	40-60	1.40-1.60	0.00-0.06	0.06-0.15	6.0-8.9	0.5-2.0	.32	.32	3	5	56
	3-20	40-60	1.45-1.65	0.00-0.06	0.10-0.15	6.0-8.9	0.5-1.0	.37	.37			
	20-60	40-60	1.60-1.75	0.00-0.06	0.06-0.10	6.0-8.9	0.5-1.0	.37	.37			
	60-80	40-60	1.70-2.00	0.00-0.06	0.02-0.05	6.0-8.9	0.5-1.0	.32	.32			
LeB: Leeray-----	0-20	40-60	1.10-1.40	0.00-0.06	0.12-0.18	9.0-25.0	1.0-5.0	.32	.32	5	4	86
	20-42	40-60	1.10-1.40	0.00-0.06	0.12-0.18	9.0-25.0	1.0-3.0	.32	.32			
	42-64	40-60	1.30-1.45	0.00-0.06	0.12-0.18	9.0-25.0	0.1-1.0	.32	.32			
	64-80	35-50	1.35-1.60	0.00-0.06	0.10-0.15	6.0-8.9	0.1-1.0	.32	.32			
LnA: Lincoln-----	0-6	10-18	1.30-1.60	6-20	0.10-0.15	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	6-80	5-10	1.30-1.60	6-20	0.02-0.08	0.0-2.9	0.0-0.5	.17	.17			
LyB: Lindy-----	0-7	20-35	1.35-1.60	0.6-2	0.12-0.20	0.0-2.9	0.5-2.0	.32	.32	2	4	86
	7-32	35-60	1.35-1.60	0.06-0.2	0.10-0.20	3.0-5.9	0.1-0.5	.32	.32			
	32-60	---	---	0.06-2	---	---	---	---	---			
MwB: Minwells-----	0-9	10-20	1.40-1.55	2-6	0.10-0.15	0.0-2.9	0.1-1.0	.24	.24	5	3	86
	9-68	35-45	1.35-1.60	0.06-0.2	0.11-0.16	3.0-5.9	0.1-1.0	.32	.32			
	68-80	3-25	1.35-1.60	2-6	0.01-0.09	0.0-2.9	0.1-1.0	.15	.24			
NcB: Newcastle-----	0-11	5-15	1.45-1.50	6-20	0.07-0.11	0.0-2.9	0.9-2.5	.20	.20	3	3	86
	11-37	18-35	1.40-1.55	0.6-2	0.10-0.14	0.0-2.9	0.5-1.0	.32	.32			
	37-60	---	1.43-1.60	0.06-0.2	---	---	0.0-0.1	---	---			
NeB: Newcastle-----	0-7	6-18	1.30-1.50	2-6	0.10-0.15	0.0-2.9	0.9-2.5	.24	.24	3	3	86
	7-28	18-35	1.40-1.55	0.6-2	0.10-0.14	0.0-2.9	0.5-1.0	.32	.32			
	28-60	6-18	1.43-1.60	0.06-0.2	---	0.0-2.9	0.0-0.1	.24	.24			

Table 25.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
NoC: Newcastle-----	0-4	6-18	1.30-1.50	2-6	0.10-0.15	0.0-2.9	0.9-2.5	.32	.32	3	3	86
	4-33	18-35	1.40-1.55	0.6-2	0.10-0.14	0.0-2.9	0.5-1.0	.32	.32			
	33-60	6-18	1.43-1.60	0.06-0.2	0.01-0.03	0.0-2.9	0.0-0.1	.24	.24			
Jolly-----	0-7	8-18	1.40-1.55	2-6	0.10-0.14	0.0-2.9	0.5-1.6	.32	.32	2	3	86
	7-15	20-35	1.40-1.65	0.6-2	0.12-0.16	0.0-2.9	0.1-1.0	.32	.32			
	15-19	15-35	1.50-1.65	0.6-2	0.12-0.16	0.0-2.9	0.1-0.9	.32	.32			
	19-60	6-18	1.43-1.60	0.06-0.2	0.01-0.03	0.0-2.9	0.0-0.1	.28	.28			
NuA: Nukrum-----	0-13	38-40	1.30-1.45	0.06-0.2	0.15-0.20	6.0-8.9	1.0-3.0	.32	.32	5	4	86
	13-43	38-60	1.35-1.50	0.06-0.2	0.15-0.20	6.0-8.9	0.5-1.0	.32	.32			
	43-80	30-55	1.35-1.50	0.06-0.2	0.13-0.18	6.0-8.9	0.5-1.0	.32	.32			
OhG: Owens-----	0-6	40-60	1.20-1.55	0.00-0.06	0.13-0.17	4.8-6.5	0.5-3.5	.32	.32	1	8	0
	6-19	35-60	1.45-1.65	0.00-0.06	0.09-0.15	4.8-6.5	0.3-2.3	.32	.32			
	19-60	40-60	1.60-2.45	0.00-0.01	0.01-0.05	4.8-6.5	0.1-0.8	.37	.37			
Harpersville-----	0-8	40-60	1.20-1.55	0.00-0.06	0.09-0.15	4.8-6.5	0.3-2.5	.32	.32	1	8	0
	8-60	40-60	1.60-2.45	0.00-0.01	0.01-0.05	4.8-6.5	0.1-0.5	.37	.37			
OnE: Owens-----	0-4	40-60	1.20-1.55	0.00-0.06	0.13-0.17	4.8-6.5	0.5-3.5	.32	.32	1	8	0
	4-17	35-60	1.45-1.65	0.00-0.06	0.09-0.15	4.8-6.5	0.3-2.3	.32	.32			
	17-60	40-60	1.60-2.45	0.00-0.01	0.01-0.05	4.8-6.5	0.1-0.8	.37	.37			
Ow: Oil-waste land-----	0-80	---	---	0.06-20	---	---	---	---	---	-	---	---
PaA: Padgett-----	0-9	40-63	1.30-1.55	0.00-0.06	0.14-0.18	7.0-8.9	1.0-3.0	.32	.32	5	4	86
	9-66	45-60	1.40-1.67	0.00-0.06	0.08-0.18	6.0-8.9	0.6-1.5	.32	.32			
	66-80	30-60	1.40-1.60	0.00-0.06	0.15-0.20	5.0-9.1	0.5-1.0	.32	.32			
PaD: Patopinto-----	0-7	18-35	1.25-1.45	0.6-2	0.07-0.10	3.0-4.0	4.0-6.0	.05	.32	1	8	0
	7-11	18-35	1.25-1.45	0.6-2	0.07-0.10	3.0-4.0	3.5-5.5	.05	.32			
	11-60	---	---	0.06-0.6	---	---	---	---	---			

Table 25.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
QU: Pits, quarry-----	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
	---	---	---	---	---	---	---	---	---	-	---	---
RwB: Rowden-----	0-13	27-40	1.25-1.45	0.6-2	0.12-0.17	6.0-7.5	2.5-4.5	.32	.32	2	6	48
	13-35	35-60	1.35-1.50	0.06-0.2	0.12-0.17	6.0-8.0	1.5-2.5	.32	.32			
	35-60	---	---	0.06-0.6	---	---	---	---	---			
SaA: Sagerton-----	0-13	17-27	1.35-1.55	0.6-2	0.11-0.15	2.0-4.0	1.0-2.5	.32	.32	5	6	48
	13-34	35-45	1.45-1.65	0.2-0.6	0.08-0.15	5.0-7.0	0.5-1.5	.32	.32			
	34-80	35-50	1.45-1.70	0.2-0.6	0.07-0.13	2.0-6.0	0.0-0.8	.32	.32			
SaB: Sagerton-----	0-9	17-27	1.35-1.55	0.6-2	0.11-0.15	2.0-4.0	1.0-2.5	.32	.32	5	6	48
	9-41	35-45	1.45-1.65	0.2-0.6	0.08-0.15	5.0-7.0	0.5-1.5	.32	.32			
	41-80	35-50	1.45-1.70	0.2-0.6	0.07-0.13	2.0-6.0	0.0-0.8	.32	.32			
ScB: Springcreek-----	0-9	15-35	1.30-1.50	0.6-2	0.10-0.15	3.0-5.9	1.0-2.0	.28	.32	2	4L	86
	9-30	20-35	1.40-1.60	0.6-2	0.05-0.10	0.0-2.9	0.1-1.0	.15	.32			
	30-40	---	---	0.00-2	---	---	---	---	---			
SeB: Set-----	0-13	27-40	1.40-1.50	0.06-0.2	0.12-0.18	3.0-5.9	2.0-4.0	.32	.32	3	4	86
	13-52	35-55	1.40-1.60	0.06-0.2	0.12-0.18	3.0-5.9	0.5-1.0	.32	.32			
	52-80	27-55	1.65-2.00	0.00-0.06	0.12-0.18	3.0-5.9	0.1-0.5	.32	.32			
SpG: Set-----	0-12	27-40	1.40-1.50	0.06-0.2	0.12-0.18	3.0-5.9	2.0-4.0	.15	.15	3	8	0
	12-44	35-55	1.40-1.60	0.06-0.2	0.12-0.18	3.0-5.9	0.1-1.0	.32	.32			
	44-60	27-55	1.65-2.00	0.00-0.06	0.12-0.18	3.0-5.9	0.1-0.5	.32	.32			
PaIopinto-----	0-4	18-35	1.25-1.45	0.6-2	0.07-0.10	3.0-4.0	4.0-6.0	.05	.32	1	8	0
	4-13	18-35	1.25-1.45	0.6-2	0.07-0.10	3.0-4.0	3.5-5.5	.05	.32			
	13-60	---	---	0.06-0.6	---	---	---	---	---			
StF: Shatruce-----	0-9	6-18	1.45-1.60	2-6	0.08-0.13	0.0-2.9	0.5-1.0	.20	.32	3	8	0
	9-26	35-50	1.40-1.55	0.06-0.2	0.14-0.18	3.0-5.9	0.5-1.0	.32	.37			
	26-60	35-50	1.50-1.70	0.00-0.06	0.06-0.10	3.0-5.9	0.2-0.8	.32	.37			

Table 25.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
StG: Shatruce-----	0-9	6-18	1.45-1.60	2-6	0.08-0.13	0.0-2.9	0.5-1.0	.20	.32	3	8	0
	9-34	35-50	1.40-1.55	0.06-0.2	0.14-0.18	3.0-5.9	0.5-1.0	.32	.37			
	34-60	35-50	1.50-1.70	0.00-0.06	0.06-0.10	3.0-5.9	0.2-0.8	.32	.37			
ThB: Thurber-----	0-8	27-35	1.40-1.65	0.2-0.6	0.11-0.14	3.0-5.9	1.0-2.0	.43	.43	5	7	38
	8-61	35-55	1.40-1.65	0.00-0.06	0.09-0.13	6.0-8.9	0.1-1.0	.32	.32			
	61-80	25-45	1.40-1.70	0.00-0.06	0.09-0.13	6.0-8.9	0.1-0.5	.32	.32			
TkC: Throck-----	0-4	30-40	1.20-1.60	0.2-0.6	0.12-0.17	6.0-8.9	0.5-2.0	.32	.32	3	4L	86
	4-40	35-60	1.45-1.65	0.06-0.2	0.12-0.17	6.0-8.9	0.5-1.0	.32	.32			
	40-48	40-60	1.45-1.65	0.06-0.2	0.12-0.17	6.0-8.9	0.5-1.0	.32	.32			
TmB: Tillman-----	48-80	25-60	1.55-1.90	0.06-0.2	0.05-0.12	6.0-8.9	0.5-1.0	.32	.32			
	0-7	27-35	1.30-1.45	0.2-0.6	0.12-0.18	3.0-5.9	1.0-3.0	.32	.32	5	6	48
	7-14	35-50	1.45-1.65	0.06-0.2	0.12-0.18	6.0-8.9	1.0-2.0	.32	.32			
TrB: Truce-----	14-36	35-50	1.45-1.65	0.06-0.2	0.12-0.18	6.0-8.9	0.1-0.5	.32	.32			
	36-62	35-50	1.45-1.70	0.06-0.2	0.11-0.17	6.0-8.9	0.1-0.5	.32	.32			
	62-80	35-45	1.45-1.90	0.06-0.2	0.02-0.09	6.0-8.9	0.1-0.5	.32	.32			
TrC: Truce-----	0-5	8-20	1.45-1.62	0.6-2	0.07-0.12	0.0-2.9	1.0-3.0	.37	.37	3	3	86
	5-56	35-55	1.50-1.65	0.06-0.2	0.09-0.12	3.0-5.9	0.5-1.0	.32	.32			
	56-80	35-55	1.60-1.80	0.00-0.06	0.05-0.09	3.0-5.9	0.5-1.0	.28	.28			
TrC: Truce-----	0-4	8-20	1.45-1.62	0.6-2	0.07-0.12	0.0-2.9	1.0-3.0	.37	.37	3	3	86
	4-44	35-55	1.50-1.65	0.06-0.2	0.09-0.12	3.0-5.9	0.5-1.0	.32	.32			
	44-80	35-55	1.60-1.80	0.00-0.06	0.05-0.09	3.0-5.9	0.5-1.0	.28	.28			
VeC: Vernon-----	0-6	40-60	1.35-1.55	0.00-0.06	0.10-0.17	6.0-8.9	0.5-2.0	.32	.32	3	4	86
	6-28	40-60	1.50-1.65	0.00-0.06	0.10-0.15	6.0-8.9	0.1-1.0	.37	.37			
	28-60	40-60	1.70-2.00	0.00-0.06	0.01-0.06	6.0-8.9	0.1-1.0	.32	.32			
W: Water-----	---	---	---	---	---	---	---	---	---	-	---	---

Table 25.--Physical Soil Properties--Continued

Map symbol and soil name	Depth In	Clay Pct	Moist bulk density g/cc	Permea- bility (Ksat) In/hr	Available water capacity In/in	Linear extensi- bility Pct	Organic matter Pct	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								Kw	Kf	T		
WwA: Westola-----	0-8	10-18	1.30-1.60	2-6	0.11-0.15	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	8-21	5-18	1.40-1.70	2-6	0.11-0.20	0.0-2.9	0.0-0.5	.32	.32			
	21-40	16-18	1.40-1.70	2-6	0.07-0.20	0.0-2.9	0.0-0.5	.32	.32			
	40-80	8-28	1.40-1.70	2-6	0.07-0.20	0.0-2.9	0.0-0.5	.32	.32			
WdB: Weswind-----	0-11	7-15	1.30-1.45	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.32	.32	5	3	86
	11-46	35-45	1.40-1.60	0.2-0.6	0.13-0.18	3.0-5.9	0.5-1.0	.32	.32			
	46-67	27-45	1.50-1.65	0.2-0.6	0.12-0.18	3.0-5.9	0.5-1.0	.32	.32			
	67-80	35-45	1.50-1.70	0.06-0.2	0.10-0.14	3.0-5.9	0.5-1.0	.32	.32			
WeA: Wheatwood-----	0-14	15-27	1.30-1.50	0.6-2	0.15-0.20	0.0-2.9	1.0-4.0	.43	.43	5	6	48
	14-51	20-35	1.35-1.55	0.6-2	0.15-0.22	0.0-2.9	0.5-1.0	.43	.43			
	51-80	15-27	1.30-1.50	0.6-2	0.15-0.20	0.0-2.9	0.1-1.0	.43	.43			
WhB: Wichita-----	0-5	28-35	1.30-1.45	0.6-2	0.15-0.20	3.0-5.9	0.5-1.0	.32	.32	5	6	48
	5-21	35-45	1.30-1.45	0.2-0.6	0.15-0.20	3.0-5.9	0.5-1.0	.32	.32			
	21-80	35-45	1.35-1.50	0.2-0.6	0.12-0.18	3.0-5.9	0.5-1.0	.32	.32			
WtB: Winters-----	0-10	15-25	1.35-1.50	0.6-2	0.15-0.19	0.0-2.9	0.5-1.0	.28	.28	5	5	56
	10-51	35-45	1.45-1.60	0.2-0.6	0.14-0.18	3.0-5.9	0.5-1.0	.28	.28			
	51-80	25-45	1.50-1.65	0.6-2	0.14-0.18	3.0-5.9	0.5-1.0	.24	.24			

Soil Survey of Young County, Texas

Table 26.--Chemical Soil Properties

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	pH	Pct	Pct	dS/m	
AbA:							
Abilene-----	0-9	15-25	6.6-8.4	0-5	0	0.0-2.0	0
	9-37	20-30	6.6-8.4	5-10	0	0.0-2.0	0
	37-80	15-30	7.9-8.4	10-40	0	0.0-2.0	0
AnB:							
Anocon-----	0-18	10-15	6.1-7.3	0	0	0	0
	18-56	15-30	6.1-7.8	0-3	0-1	0	0
	56-80	12-25	6.6-8.4	0-7	0-5	0	0
BgB:							
Bluegrove-----	0-5	5.0-15	5.6-7.3	0	0	0.0-2.0	0
	5-34	15-30	6.1-8.4	0-5	0	0.0-2.0	0
	34-60	---	---	---	---	---	---
BoB:							
Bonti-----	0-8	5.0-12	5.6-7.3	0	0	0	0
	8-26	15-30	5.1-6.0	0	0	0	0
	26-60	---	---	---	---	---	---
BpC:							
Bastrop-----	0-15	2.0-10	5.6-7.8	0	0	0.0-2.0	0
	15-45	10-20	5.6-8.4	0-5	0	0.0-2.0	0
	45-80	5.0-15	6.1-8.4	0-5	0	0.0-2.0	0
BsB:							
Bastrop-----	0-13	2.0-10	5.6-7.8	0	0	0.0-2.0	0
	13-80	10-20	5.6-8.4	0-5	0	0.0-2.0	0
BsC2:							
Bastrop, eroded-----	0-4	2.0-10	5.6-7.8	0	0	0.0-2.0	0
	4-50	10-20	5.6-8.4	0-5	0	0.0-2.0	0
	50-80	5.0-15	6.1-8.4	0-5	0	0.0-2.0	0
CaC2:							
Callahan-----	0-5	10-20	6.6-8.4	0	0	0	0
	5-34	15-30	7.4-8.4	2-10	0	0	0
	34-50	10-20	6.6-8.4	0-10	0	0	0
	50-60	10-20	6.6-8.4	0-10	0	0	0
ChB:							
Chaney-----	0-12	2.0-5.0	5.6-7.3	0	0	0.0-2.0	0
	12-46	15-30	5.6-7.3	0	0	0.0-2.0	0
	46-57	15-30	5.6-8.4	0-2	0-2	0.0-2.0	0
	57-80	15-30	5.6-8.4	0-2	0-2	0.0-2.0	0
CkA:							
Clearfork-----	0-28	18-24	7.4-8.4	0-13	0	0.0-1.5	0
	28-80	12-22	7.4-8.4	5-15	0	0.0-1.5	0-2
DAM:							
Dams-----	---	---	---	---	---	---	---
DeB:							
Decordova-----	0-14	1.0-5.0	5.6-7.3	0	0	0	0
	14-80	3.0-10	5.6-8.4	0	0	0	0

Soil Survey of Young County, Texas

Table 26.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	pH	Pct	Pct	dS/m	
DnB:							
Deandale-----	0-18	15-30	6.1-8.4	0	0	0.0-4.0	0-5
	18-80	35-55	6.6-8.4	5-10	0	0.0-4.0	5-13
EnB:							
Enterprise-----	0-9	5.0-12	6.6-8.4	0-5	0	0.0-2.0	0
	9-60	5.0-10	7.4-8.4	15-30	0	0.0-2.0	0
	60-80	5.0-10	7.4-8.4	5-15	0	0.0-2.0	0
EnC:							
Enterprise-----	0-5	5.0-12	6.6-8.4	0-5	0	0.0-2.0	0
	5-50	5.0-10	7.4-8.4	15-30	0	0.0-2.0	0
	50-80	5.0-10	7.4-8.4	5-15	0	0.0-2.0	0
ExD:							
Exray-----	0-5	4.0-7.0	6.1-7.3	0	0	0	0
	5-12	15-35	5.6-6.5	0	0	0	0
	12-60	---	---	---	---	---	---
Loving-----	0-6	7.0-13	6.1-7.3	0	0	0	0
	6-16	7.0-16	6.1-7.3	0	0	0	0
	16-60	---	---	---	---	---	---
GaB:							
Gageby-----	0-22	10-25	7.4-8.4	0-2	0	0	0
	22-58	10-25	7.9-8.4	0-5	0	0	0
	58-80	10-25	7.9-8.4	2-20	0	0	0
GdF:							
Goodnight-----	0-18	4.0-8.0	6.1-8.4	0-2	0	0	0
	18-40	4.0-8.0	6.1-8.4	0-2	0	0	0
	40-80	4.0-8.0	6.1-8.4	0-2	0	0	0
GeA:							
Gowen-----	0-30	10-20	6.6-8.4	0	0	0.0-2.0	0
	30-80	10-25	6.6-8.4	0-5	0-2	0.0-2.0	0
GfB:							
Grandfield-----	0-8	6.0-9.0	6.1-7.8	0	0	0	0
	8-40	14-21	6.1-7.8	0	0	0	0
	40-56	14-21	6.6-8.4	0	0	0	0
	56-80	12-18	6.6-8.4	0-5	0	0	0
GnB:							
Grandfield-----	0-5	9.0-14	6.1-7.8	0	0	0	0
	5-28	14-21	6.1-7.8	0	0	0	0
	28-41	14-21	6.6-8.4	0	0	0	0
	41-80	12-18	6.6-8.4	0-5	0	0	0
GnC:							
Grandfield-----	0-5	9.0-14	6.1-7.8	0	0	0	0
	5-18	14-21	6.1-7.8	0	0	0	0
	18-56	14-21	6.6-8.4	0	0	0	0
	56-80	12-18	6.6-8.4	0-5	0	0	0

Soil Survey of Young County, Texas

Table 26.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	pH	Pct	Pct	dS/m	
GrB: Grandmore-----	0-18	6.0-11	6.6-8.4	0	0	0	0
	18-38	11-18	7.4-8.4	0	0	0	0
	38-59	18-27	7.4-8.4	0	0	0	0
HeC: Heaton-----	0-32	1.0-3.0	5.6-7.3	0	0	0	0
	32-57	5.0-15	5.6-7.3	0	0	0	0
	57-80	3.0-15	5.6-7.3	0	0	0	0
HnB: Hensley-----	0-4	5.0-15	6.1-7.8	0	0	0.0-2.0	0
	4-14	15-30	6.6-8.4	0	0	0.0-2.0	0
	14-20	---	---	---	---	---	---
HsB: Hensley-----	0-5	5.0-15	6.1-7.8	0	0	0.0-2.0	0
	5-14	15-30	6.6-8.4	0	0	0.0-2.0	0
	14-19	---	---	---	---	---	---
JaB: Jacksboro-----	0-4	5.0-10	6.1-7.3	0	0	0	0
	4-11	5.0-10	5.6-7.3	0	0	0	0
	11-18	15-30	5.1-6.5	0	0	0	0
	18-25	---	---	---	---	---	---
JrE: Jolly-----	0-4	5.0-15	5.6-7.3	0	0	0.0-0.3	0
	4-12	9.0-20	6.1-7.3	0	0	0.0-0.2	0
	12-60	3.1-9.3	6.1-8.4	0	0	0.0-0.2	0
Rock outcrop-----	0-80	---	---	---	---	---	---
KaA: Kamay-----	0-12	8.0-15	6.1-7.8	0	0	0.0-2.0	0-5
	12-52	10-30	6.6-8.6	0-5	0-2	4.0-8.0	1-25
	52-80	10-20	7.9-8.6	0-4	0-2	4.0-8.0	8-25
KvE: Knoco-----	0-5	12-24	7.4-8.4	1-8	0-15	1.0-8.0	0-8
	5-13	14-42	7.4-8.4	1-8	0-15	1.0-8.0	0-8
	13-80	14-42	7.4-8.4	1-8	0-15	1.0-8.0	0-8
Vernon-----	0-3	15-25	7.9-8.4	5-15	0	0	0-2
	3-25	20-35	7.9-8.4	15-30	0-2	0	2-15
	25-53	20-35	7.9-8.4	5-20	0	2.0-8.0	5-15
	53-80	15-25	7.9-8.4	5-20	0	2.0-8.0	10-25
KvG: Knoco-----	0-3	12-24	7.4-8.4	1-8	0-15	1.0-8.0	0-8
	3-9	14-42	7.4-8.4	1-8	0-15	1.0-8.0	0-8
	9-80	14-42	7.4-8.4	1-8	0-15	1.0-8.0	0-8
Vernon-----	0-3	15-25	7.9-8.4	5-15	0	0	0-2
	3-20	20-35	7.9-8.4	15-30	0-2	0	2-15
	20-60	20-35	7.9-8.4	5-20	0	2.0-8.0	5-15
	60-80	15-25	7.9-8.4	5-20	0	2.0-8.0	10-25

Soil Survey of Young County, Texas

Table 26.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	pH	Pct	Pct	dS/m	
LeB: Leeray-----	0-20	30-50	6.6-7.8	0-5	0	0.0-2.0	0-2
	20-42	30-50	7.4-8.4	2-15	0-2	0.0-2.0	0-5
	42-64	20-40	7.9-8.4	10-35	0-5	0.0-4.0	5-15
	64-80	20-40	7.9-8.4	10-35	0-5	4.0-16.0	5-20
LnA: Lincoln-----	0-6	7.0-12	7.4-8.4	0-5	0	0	0
	6-80	4.0-10	7.9-8.4	0-5	0	0	0
LyB: Lindy-----	0-7	10-25	6.1-7.8	0	0	0.0-2.0	0
	7-32	20-35	6.1-7.8	0-5	0	0.0-2.0	0
	32-60	---	---	---	---	---	---
MwB: Minwells-----	0-9	5.0-10	6.1-7.8	0	0	0	0
	9-68	15-25	5.6-7.8	0	0	0	0
	68-80	1.0-10	6.6-8.4	0-11	0	0	0
NcB: Newcastle-----	0-11	4.7-13	5.1-6.5	0	0	0	0
	11-37	15-27	6.1-8.4	0-5	0	0.0-2.0	0
	37-60	---	---	---	---	---	---
NeB: Newcastle-----	0-7	14-20	6.1-7.3	0	0	0.0-2.0	0
	7-28	5.0-22	6.1-8.4	0-5	0	0.0-2.0	0
	28-60	4.8-14	6.1-8.4	0-5	0	0.0-2.0	0
NoC: Newcastle-----	0-4	14-20	6.1-7.3	0	0	0.0-2.0	0
	4-33	5.0-22	6.1-8.4	0-5	0	0.0-2.0	0
	33-60	4.8-14	6.1-8.4	0-5	0	0.0-2.0	0
Jolly-----	0-7	5.0-15	5.6-7.3	0	0	0.0-0.3	0
	7-15	10-20	6.1-7.3	0	0	0.0-0.2	0
	15-19	9.0-15	6.1-7.3	0	0	0.0-0.2	0
	19-60	3.1-9.3	6.1-8.4	0	0	0	0
NuA: Nukrum-----	0-13	30-45	7.4-8.4	0-5	0	0	0
	13-43	30-45	7.4-8.4	2-10	0	0	0
	43-80	30-40	7.4-8.4	15-30	0	0	0
OhG: Owens-----	0-6	15-28	7.4-8.4	5-15	0	0.3-1.0	0-1
	6-19	15-30	7.4-8.4	2-15	0-4	0.4-6.0	0-10
	19-60	12-22	7.4-8.4	0-10	0-4	1.0-8.0	0-10
Harpersville-----	0-8	15-28	7.4-8.4	3-10	0	0.3-1.0	0-1
	8-60	12-22	7.4-8.4	0-5	0-4	1.0-8.0	0-10
OnE: Owens-----	0-4	15-28	7.4-8.4	5-15	0	0.3-1.0	0-1
	4-17	15-30	7.4-8.4	2-15	0-4	0.4-6.0	0-10
	17-60	12-22	7.4-8.4	0-10	0-4	1.0-8.0	0-10

Soil Survey of Young County, Texas

Table 26.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	pH	Pct	Pct	dS/m	
Ow: Oil-waste land-----	0-80	---	---	---	---	---	---
PaA: Padgett-----	0-9	25-33	6.7-8.4	0-2	0	0.0-2.0	0-3
	9-66	24-32	7.4-8.4	2-10	0	0.5-6.0	1-12
	66-80	24-32	7.4-8.4	2-10	0	2.0-8.0	5-12
PaD: Palopinto-----	0-7	20-35	6.1-8.0	0-3	0	0.3-1.0	0
	7-11	20-35	6.1-8.0	0-5	0	0.3-1.0	0
	11-60	---	---	---	---	---	---
QU: Pits, quarry-----	---	---	---	---	---	---	---
RwB: Rowden-----	0-13	20-30	6.6-8.4	0-2	0	0	0
	13-35	25-40	6.6-8.4	2-10	0	0.0-2.0	0
	35-60	---	---	---	---	---	---
SaA: Sagerton-----	0-13	15-25	6.6-7.8	0-5	0	0.0-2.0	0
	13-34	20-30	6.6-8.4	0-5	0	0.0-2.0	0
	34-80	20-30	7.4-8.7	15-35	0	0.0-2.0	0
SaB: Sagerton-----	0-9	15-25	6.6-7.8	0-5	0	0.0-2.0	0
	9-41	20-30	6.6-8.4	0-5	0	0.0-2.0	0
	41-80	20-30	7.4-8.7	15-35	0	0.0-2.0	0
ScB: Springcreek-----	0-9	10-20	7.9-8.4	40-65	0	0	0
	9-30	10-20	7.9-8.4	40-85	0	0	0
	30-40	---	---	---	0	0	0
SeB: Set-----	0-13	10-20	7.9-8.4	20-30	0	0.3-2.0	0
	13-52	15-25	7.9-8.4	40-65	0	0.3-2.0	0
	52-80	10-25	7.9-8.4	40-65	0	0.3-2.0	0
SpG: Set-----	0-12	10-20	7.9-8.4	20-30	0	0.3-2.0	0
	12-44	10-25	7.9-8.4	40-65	0	0.3-2.0	0
	44-60	10-25	7.9-8.4	40-65	0	0.3-2.0	0
Palopinto-----	0-4	20-35	6.1-8.0	0-3	0	0.3-1.0	0
	4-13	20-35	6.1-8.0	0-5	0	0.3-1.0	0
	13-60	---	---	---	---	---	---
StF: Shatruce-----	0-9	5.0-12	5.6-7.3	0	0	0	0
	9-26	20-35	4.5-6.5	0	0	0	0
	26-60	20-35	4.5-6.5	0	0	0	0

Soil Survey of Young County, Texas

Table 26.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	pH	Pct	Pct	dS/m	
StG: Shatruce-----	0-9	5.0-12	5.6-7.3	0	0	0	0
	9-34	20-35	4.5-6.5	0	0	0	0
	34-60	20-35	4.5-6.5	0	0	0	0
ThB: Thurber-----	0-8	18-35	6.1-7.8	0-1	0	0.0-2.0	0-2
	8-61	32-50	6.6-8.4	1-5	0	0.0-2.0	2-10
	61-80	22-40	7.4-8.4	1-7	0-1	0.0-2.0	2-10
TkC: Throck-----	0-4	16-21	7.9-8.4	1-10	0	0	0-4
	4-40	18-32	7.9-8.4	4-15	0-2	0.0-4.0	2-8
	40-48	21-32	7.9-8.4	15-40	0-4	0.0-8.0	4-20
	48-80	13-32	7.9-8.4	10-20	0-6	2.0-8.0	4-20
TmB: Tillman-----	0-7	10-20	6.6-8.4	0	0	0.0-2.0	0-1
	7-14	15-30	7.4-8.4	2-5	0-2	0.0-2.0	0-1
	14-36	15-30	7.4-8.4	2-5	0-2	0.0-2.0	0-1
	36-62	15-30	7.9-8.4	15-35	0-2	0.0-8.0	0-1
	62-80	15-30	7.9-8.4	2-15	0-2	0.0-8.0	0-1
TrB: Truce-----	0-5	5.0-10	5.6-7.3	0	0	0	0
	5-56	15-30	6.1-8.4	0-5	0	0	0
	56-80	10-20	6.6-8.4	0-10	0	0	0
TrC: Truce-----	0-4	5.0-10	5.6-7.3	0	0	0	0
	4-44	15-30	6.1-8.4	0-5	0	0	0
	44-80	10-20	6.6-8.4	0-10	0	0	0
VeC: Vernon-----	0-6	15-25	7.9-8.4	5-15	0	0.0-2.0	0-2
	6-28	20-35	7.9-8.4	15-30	0-2	0.0-2.0	2-15
	28-60	15-25	7.9-8.4	5-20	0-2	2.0-8.0	10-25
W: Water-----	---	---	---	---	---	---	---
WaA: Westola-----	0-8	7.0-11	7.4-8.4	1-5	0	0	0
	8-21	4.0-11	7.9-8.4	1-10	0	0	0
	21-40	4.0-11	7.9-8.4	1-10	0	0	0
	40-80	4.0-11	7.9-8.4	1-10	0	0	0
WdB: Weswind-----	0-11	5.0-11	5.6-6.5	0	0	0	0
	11-46	13-18	5.6-7.8	0	0	0	0
	46-67	15-22	6.6-8.4	0-5	0	0	0
	67-80	13-19	7.9-8.4	10-30	0	0	0
WeA: Wheatwood-----	0-14	5.0-15	7.9-8.4	1-15	0	0.0-2.0	0-1
	14-51	10-25	7.9-8.4	5-15	0	0.0-4.0	0-1
	51-80	5.0-15	7.9-9.0	5-10	0	0.0-4.0	0-1

Soil Survey of Young County, Texas

Table 26.--Chemical Soil Properties--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	Inches	meq/100 g	pH	Pct	Pct	dS/m	
WhB: Wichita-----	0-5	10-20	6.6-7.8	0	0	0	0
	5-21	20-30	6.6-8.4	10-30	0	0	0
	21-80	20-30	7.9-8.4	15-35	0	0	0
WtB: Winters-----	0-10	5.0-15	6.1-7.8	0	0	0	0
	10-51	20-30	6.1-7.8	0-5	0	0	0
	51-80	20-30	7.9-8.4	10-35	0	0	0

Soil Survey of Young County, Texas

Table 27.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
AbA: Abilene-----	---	In	In	---	High	Low
AnB: Anocon-----	---	---	---	---	Moderate	Low
BgB: Bluegrove-----	Paralithic bedrock	20-40	---	Weakly cemented	Moderate	Low
BoB: Bonti-----	Paralithic bedrock	20-40	---	Moderately cemented	High	Moderate
BpC: Bastrop-----	---	---	---	---	Moderate	Low
BsB: Bastrop-----	---	---	---	---	Moderate	Low
BsC2: Bastrop, eroded-----	---	---	---	---	Moderate	Low
CaC2: Callahan-----	Densic bedrock	20-40	---	Noncemented	High	Low
ChB: Chaney-----	Densic bedrock	40-60	---	Noncemented	High	Moderate
CkA: Clearfork-----	---	---	---	---	High	Low
DAM: Dams-----	---	---	---	---	---	---
DeB: Decordova-----	---	---	---	---	Low	Low
DnB: Deandale-----	---	---	---	---	High	Moderate
EnB: Enterprise-----	---	---	---	---	Low	Low
EnC: Enterprise-----	---	---	---	---	Low	Low
ExD: Exray-----	Paralithic bedrock	10-20	---	Moderately cemented	High	Moderate
Loving-----	Paralithic bedrock	10-20	---	Moderately cemented	Low	Moderate
GaB: Gageby-----	---	---	---	---	Moderate	Low

Soil Survey of Young County, Texas

Table 27.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
GdF: Goodnight-----	---	In	In	---	Low	Low
GeA: Gowen-----	---	---	---	---	Moderate	Low
GfB: Grandfield-----	---	---	---	---	Low	Low
GnB: Grandfield-----	---	---	---	---	Low	Low
GnC: Grandfield-----	---	---	---	---	Low	Low
GrB: Grandmore-----	---	---	---	---	High	Low
HeC: Heaton-----	---	---	---	---	Moderate	Low
HnB: Hensley-----	Lithic bedrock	10-20	---	Indurated	High	Low
HsB: Hensley-----	Lithic bedrock	10-20	---	Indurated	High	Low
JaB: Jacksboro-----	Lithic bedrock	15-20	---	Indurated	High	Low
JrE: Jolly-----	Paralithic bedrock	12-20	---	Weakly cemented	Low	Low
Rock outcrop-----	Lithic bedrock	0-2	---	Indurated	High	Low
KaA: Kamay-----	---	---	---	---	High	Moderate
KvE: Knoco-----	Densic bedrock	3-20	---	Noncemented	High	Low
Vernon-----	Densic bedrock	20-40	---	Noncemented	High	Low
KvG: Knoco-----	Densic bedrock	3-20	---	Noncemented	High	Low
Vernon-----	Densic bedrock	20-40	---	Noncemented	High	Low
LeB: Leeray-----	---	---	---	---	High	Low
LnA: Lincoln-----	---	---	---	---	Low	Low
LyB: Lindy-----	Lithic bedrock	20-40	---	Indurated	High	Low

Soil Survey of Young County, Texas

Table 27.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top In	Thickness In	Hardness	Uncoated steel	Concrete
MwB: Minwells-----	---	---	---	---	High	Low
NcB: Newcastle-----	Densic bedrock	20-40	---	Noncemented	Moderate	Low
NeB: Newcastle-----	Densic bedrock	20-40	---	Noncemented	Moderate	Low
NoC: Newcastle-----	Densic bedrock	20-40	---	Noncemented	Moderate	Low
Jolly-----	Paralithic bedrock	12-20	---	Weakly cemented	Low	Low
NuA: Nukrum-----	---	---	---	---	High	Low
OhG: Owens-----	Densic bedrock	14-30	---	Noncemented	High	Low
Harpersville-----	Densic bedrock	3-14	---	Noncemented	High	Low
OnE: Owens-----	Densic bedrock	14-30	---	Noncemented	High	Low
Ow: Oil-waste land-----	---	---	---	---	High	Moderate
PaA: Padgett-----	---	---	---	---	High	Low
PaD: Palopinto-----	Lithic bedrock	6-20	---	Indurated	High	Low
QU: Pits, quarry-----	---	---	---	---	---	---
RwB: Rowden-----	Lithic bedrock	20-40	---	Indurated	High	Low
SaA: Sagerton-----	---	---	---	---	Moderate	Low
SaB: Sagerton-----	---	---	---	---	Moderate	Low
ScB: Springcreek-----	Lithic bedrock	20-40	0-3	Indurated	High	Low
SeB: Set-----	Densic bedrock	40-60	---	Noncemented	High	Low
SpG: Set-----	Densic bedrock	40-60	---	Noncemented	High	Low
Palopinto-----	Lithic bedrock	6-20	---	Indurated	High	Low

Soil Survey of Young County, Texas

Table 27.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Uncoated steel	Concrete
StF: Shatruce-----	Densic bedrock	In 20-40	In ---	Noncemented	High	Moderate
StG: Shatruce-----	Densic bedrock	20-40	---	Noncemented	High	Moderate
ThB: Thurber-----	---	---	---	---	High	Low
TkC: Throck-----	Densic bedrock	30-60	---	Noncemented	High	Low
TmB: Tillman-----	---	---	---	---	High	Low
TrB: Truce-----	Densic bedrock	40-60	---	Noncemented	High	Low
TrC: Truce-----	Densic bedrock	40-60	---	Noncemented	High	Low
VeC: Vernon-----	Densic bedrock	20-40	---	Noncemented	High	Low
W: Water-----	---	---	---	---	---	---
WaA: Westola-----	---	---	---	---	Low	Low
WdB: Weswind-----	---	---	---	---	High	Low
WeA: Wheatwood-----	---	---	---	---	High	Low
WhB: Wichita-----	---	---	---	---	Moderate	Low
WtB: Winters-----	---	---	---	---	High	Low

Table 28.--Water Features

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydro- logic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
AbA: Abilene-----	C	Negligible	Jan-Dec	Ft	Ft	Ft	---	None	---	None
AnB: Anocon-----	C	Medium	Jan-Dec	---	---	---	---	None	---	None
BgB: Bluegrove-----	C	Medium	Jan-Dec	---	---	---	---	None	---	None
BoB: Bonti-----	C	Medium	Jan-Dec	---	---	---	---	None	---	None
BpC: Bastrop-----	B	Low	Jan-Dec	---	---	---	---	None	---	None
BsB: Bastrop-----	B	Low	Jan-Dec	---	---	---	---	None	---	None
BsC2: Bastrop, eroded-----	B	Low	Jan-Dec	---	---	---	---	None	---	None
CaC2: Callahan-----	D	High	Jan-Dec	---	---	---	---	None	---	None
ChB: Chaney-----	C	High	Jan-Dec	---	---	---	---	None	---	None
CkA: Clearfork-----	C	Negligible	Apr-Oct	---	---	---	---	None	Brief	Occasional
DAM: Dams-----	D	---	Jan-Dec	---	---	---	---	---	---	---
DeB: Decordova-----	A	Very low	Jan-Dec	---	---	---	---	None	---	None

Table 28.---Water Features---Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper Limit	Lower Limit	Surface water depth	Duration	Frequency	Duration	Frequency
DnB: Deandale-----	D	Medium	Jan-Dec	Ft	Ft	Ft	---	None	---	None
EnB: Enterprise-----	A	Very low	Jan-Dec	---	---	---	---	None	---	None
EnC: Enterprise-----	A	Very low	Jan-Dec	---	---	---	---	None	---	None
ExD: Exray-----	D	High	Jan-Dec	---	---	---	---	None	---	None
Loving-----	D	Medium	Jan-Dec	---	---	---	---	None	---	None
GaB: Gageby-----	B	Negligible	Apr-May Sep-Oct	---	---	---	---	None	Very brief Very brief	Occasional Occasional
GdF: Goodnight-----	A	Very low	Jan-Dec	---	---	---	---	None	---	None
GeA: Gowen-----	B	Negligible	Apr-May Sep-Oct	---	---	---	---	None	Very brief Very brief	Occasional Occasional
GfB: Grandfield-----	B	Low	Jan-Dec	---	---	---	---	None	---	None
GnB: Grandfield-----	B	Low	Jan-Dec	---	---	---	---	None	---	None
GnC: Grandfield-----	B	Low	Jan-Dec	---	---	---	---	None	---	None
GrB: Grandmore-----	C	Low	Jan-Dec	---	---	---	---	None	---	None
HeC: Heaton-----	B	Very low	Jan-Dec	---	---	---	---	None	---	None

Table 28.---Water Features---Continued

Map symbol and soil name		Hydro- logic group	Surface runoff	Month	Water table		Ponding			Flooding	
					Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
HnB: Hensley-----		D	High	Jan-Dec	Ft	Ft	Ft	---		---	None
HsB: Hensley-----		D	High	January	---	---	---	---		---	None
JaB: Jacksboro-----		D	Medium	Jan-Dec	---	---	---	---		---	None
JrE: Jolly-----		D	Medium	Jan-Dec	---	---	---	---		---	None
Rock outcrop-----		---	---	Jan-Dec	---	---	---	---		---	None
KaA: Kamay-----		D	Medium	Jan-Dec	---	---	---	---		---	None
KvE: Knoco-----		D	Very high	Jan-Dec	---	---	---	---		---	None
Vernon-----		D	Very high	Jan-Dec	---	---	---	---		---	None
KvG: Knoco-----		D	Very high	Jan-Dec	---	---	---	---		---	None
Vernon-----		D	High	Jan-Dec	---	---	---	---		---	None
LeB: Leeray-----		D	Medium	Jan-Dec	---	---	---	---		---	None
LnA: Lincoln-----		A	Negligible	Jan-Mar Apr-May Sep-Oct Nov-Dec	5.0-8.0 5.0-8.0 --- 5.0-8.0	>6.0 >6.0 --- >6.0	---	---		---	None None None None
LyB: Lindy-----		D	High	Jan-Dec	---	---	---	---		---	None

Table 28.---Water Features---Continued

Map symbol and soil name		Hydro- logic group	Surface runoff	Month	Water table		Ponding			Flooding	
					Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
MwB: Minwells-----		C	High	Jan-Dec	Ft	Ft	Ft	---	None	---	None
NCB: Newcastle-----		C	Low	Jan-Dec	---	---	---	---	None	---	None
NeB: Newcastle-----		C	Low	Jan-Dec	---	---	---	---	None	---	None
NoC: Newcastle-----		C	Low	Jan-Dec	---	---	---	---	None	---	None
NoC: Jolly-----		D	Low	Jan-Dec	---	---	---	---	None	---	None
NuA: Nukrum-----		C	Medium	Jan-Dec	---	---	---	---	None	---	None
OhG: Owens-----		D	Very high	Jan-Dec	---	---	---	---	None	---	None
OhG: Harpersville-----		D	Very high	Jan-Dec	---	---	---	---	None	---	None
OnE: Owens-----		D	Very high	Jan-Dec	---	---	---	---	None	---	None
Ow: Oil-waste land-----		D	---	Jan-Dec	---	---	---	---	---	---	None
PaA: Padgett-----		D	High	Apr-May Sep-Oct	---	---	---	---	None	Very brief Very brief	Occasional Occasional
PaD: Patopinto-----		D	Low	Jan-Dec	---	---	---	---	None	---	None
QU: Pits, quarry-----		---	---	Jan-Dec	---	---	---	---	---	---	---
RwB: Rowden-----		D	Low	Jan-Dec	---	---	---	---	None	---	None

Table 28.---Water Features---Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Month	Water table			Ponding			Flooding		
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency		
SaA: Sagerton-----	C	Negligible	Jan-Dec	Ft	Ft	Ft	---	---	None	---	None	
SaB: Sagerton-----	C	Very low	Jan-Dec	---	---	---	---	---	None	---	None	
ScB: Springcreek-----	C	Low	Jan-Dec	---	---	---	---	---	None	---	None	
SeB: Set-----	C	High	Jan-Dec	---	---	---	---	---	None	---	None	
SpG: Set-----	C	High	Jan-Dec	---	---	---	---	---	None	---	None	
PaIopinto-----	D	High Medium	Jan-Dec	---	---	---	---	---	None	---	None	
StF: Shatrue-----	D	Very high	Jan-Dec	---	---	---	---	---	None	---	None	
StG: Shatrue-----	D	Very high	Jan-Dec	---	---	---	---	---	None	---	None	
ThB: Thurber-----	D	Very high	Jan-Dec	---	---	---	---	---	None	---	None	
TkC: Throck-----	C	High	Jan-Dec	---	---	---	---	---	None	---	None	
TmB: Tillman-----	C	High	Jan-Dec	---	---	---	---	---	None	---	None	
TrB: Truce-----	C	High	Jan-Dec	---	---	---	---	---	None	---	None	
TrC: Truce-----	C	High	Jan-Dec	---	---	---	---	---	None	---	None	
VeC: Vernon-----	D	Very high	Jan-Dec	---	---	---	---	---	None	---	None	

Table 28.--Water Features--Continued

Map symbol and soil name	Hydro- logic group	Surface runoff	Month	Water table			Ponding			Flooding		
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency		
W: Water-----	---	---	Jan-Dec	Ft	Ft	Ft	---	---	---	---	---	
WaA: westola-----	A	Negligible	Apr-May Sep-Oct	---	---	---	---	---	---	Very brief Very brief	Occasional Occasional	
WdB: Weswind-----	C	Very low	Jan-Dec	---	---	---	---	---	---	---	None	
WeA: wheatwood-----	B	Negligible	Apr-May Sep-Oct	---	---	---	---	---	---	Very brief Very brief	Occasional Occasional	
WhB: Wichita-----	C	Medium	Jan-Dec	---	---	---	---	---	---	---	None	
WtB: Winters-----	C	Medium	Jan-Dec	---	---	---	---	---	---	---	None	

Table 29.--Physical Analyses of Selected Soils
(Dashes indicate analyses were not made)

Soil name and sample number	Depth	Horizon	Particle-size distribution							COLE	Bulk		Water	
			Sand								Total Silt	Total Clay	Density	Content
			Very coarse (2.0-1.0 mm)	Coarse (1.0-0.5mm)	Medium (0.5-0.25mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2.0-0.05 mm)						
In			(Percent)							cm/cm	g/cc	g/cc	Pct	Pct
Bluegrove (1,3) S92TX-503-007	0-5	A	0.6	0.5	3.0	31.5	23.5	59.1	29.2	11.7	1.47	1.52	17.0	4.8
	5-9	Bt1	0.5	0.7	3.2	29.3	18.9	52.6	22.8	24.6	1.58	1.63	18.5	7.3
	9-19	Bt2	0.5	0.3	1.1	11.9	10.8	24.6	17.6	57.8	1.48	1.74	24.6	16.7
	19-29	Bt3	tr	0.1	0.4	5.2	10.7	16.4	22.4	61.2	1.61	1.85	20.2	17.5
	29-34	BCt	0.1	0.3	0.5	15.0	19.4	35.3	17.6	47.1	1.56	1.72	21.2	13.5
	34-43	R	1	1.3	1.2	51.4	14.4	69.3	14.3	16.4	---	---	---	---
	0-4	A1	0.1	tr	0.9	11.7	12.2	24.9	49.0	26.1	1.53	1.73	20.1	11.5
	4-12	A2	tr	0.1	1.5	17.9	19.7	39.2	36.6	24.2	1.55	1.58	17.6	9.3
	12-23	A3	tr	0.1	1.8	19.5	19.5	40.9	40.6	18.5	1.47	1.55	19.2	7.9
	23-30	AB	tr	tr	1.5	18.8	23.8	44.1	30.2	25.7	1.53	1.77	20.3	9.1
	30-41	Bw	--	0.1	3.3	27.6	20.6	51.6	25.3	23.1	1.67	1.78	15.2	8.5
	41-51	AB	tr	tr	2.5	24.9	17.1	44.5	29.6	25.9	1.78	1.86	15.5	9.6
	51-57	Bw1	--	tr	4.8	33.6	13.5	51.9	23.6	24.5	1.76	1.91	15.4	9.0
	57-75	Bw2	0.8	0.7	5.8	29.4	15.0	51.7	24.2	24.1	1.72	1.79	13.1	8.9
	75-85	Bw3	1.2	1.6	8.3	25.7	11.7	48.5	26.9	24.6	1.70	1.83	14.6	9.7
S92TX-503-002	0-3	A1	0.3	0.4	11.1	59.5	8.2	79.5	10.7	9.8	1.48	1.52	10.8	4.3
	3-7	A2	0.5	0.5	12.2	57.5	6.9	77.6	9.3	13.1	1.51	1.63	14.9	4.2
	7-15	Bt	0.8	0.6	9.4	48.4	5.3	64.5	8.6	26.9	1.59	1.65	18.0	8.3
	15-20	BCt	0.8	0.8	13.7	46.9	5.1	67.3	11.1	21.6	1.48	1.57	14.5	7.3
	20-26	Cr	0.1	0.6	12.6	51.6	6.3	71.2	17.0	11.8	1.00	1.00	55.4	---
	0-5	A1	0.3	1.3	3.1	9.1	12.5	26.4	50.2	23.5	1.59	1.77	19.5	8.6
	5-12	A2	0.4	1.4	2.6	9.9	12.6	26.9	46.3	26.8	1.58	1.63	18.5	9.2
	12-23	Bt	0.7	1.0	2.1	6.4	8.0	18.2	31.7	50.1	1.43	1.86	29.2	17.2
	23-33	Btk1	2.0	1.8	2.3	6.2	8.9	21.2	35.2	43.6	1.63	1.93	23.6	15.1
	33-44	Btk2	1.4	1.4	2.1	7.1	9.3	21.3	36.6	42.1	1.57	1.88	23.6	13.8
	44-52	Btk3	1.6	1.3	2.0	6.3	7.6	18.8	37.8	43.4	1.54	1.89	24.8	14.4
	52-63	BCtk1	0.5	0.7	1.3	2.1	5.1	9.7	50.4	39.9	1.71	1.87	17.1	12.3
	63-74	BCtk2	1.6	2.3	3.6	4.2	2.3	14.0	47.5	38.5	1.78	2.03	16.9	11.9
	74-84	Cr	0.2	0.6	1.3	2.3	7.6	12.0	52.7	35.3	---	---	---	---

Table 29.--Physical Analyses of Selected Soils--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution							COLE	Bulk Density		Water Content			
			Sand					Total (2.0-0.05 mm)	Total Silt		Total Clay	1/3-bar	Oven Dry	1/3-bar	15-bar	
			Very coarse (2.0-1.0 mm)	Coarse (1.0-0.5mm)	Medium (0.5-0.25mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)									
In			(Percent)							cm/cm	g/cc	g/cc	Pct	Pct		
Kamay (1,3)	0-4	A	0.1	0.3	6.6	42.8	15.6	65.4	22.8	11.8	0.026	1.52	1.64	13.5	4.7	
	4-9	Bt1	0.2	0.3	7.9	41.2	13.7	63.3	18.9	17.8	---	---	---	---	5.9	
	9-21	Bt2	0.1	0.2	6.5	35.1	13.8	55.7	20.5	23.8	0.018	1.65	1.74	15.0	8.1	
	21-30	Bt3	0.1	0.2	6.2	32.5	13.5	52.5	23.8	23.7	0.010	1.67	1.72	14.0	7.8	
	30-33	Bt4	0.5	0.5	6.2	34.8	11.8	53.8	21.5	24.7	0.012	1.66	1.72	15.3	8.4	
	33-44	Cr/Bt	---	---	---	---	---	---	---	---	---	---	---	---	---	
	0-4	A1	0.2	0.6	2.6	34.1	19.5	57.0	28.9	14.1	0.008	1.61	1.65	12.8	5.3	
	4-11	A2	0.1	0.6	2.5	31.6	18.1	52.9	28.2	18.9	0.017	1.56	1.64	14.4	6.4	
	11-17	Bt1	0.2	0.5	1.9	22.6	15.4	40.6	23.8	35.6	0.059	1.54	1.83	20.8	11.6	
	17-25	Bt2	0.2	0.4	1.7	20.4	12.4	35.1	22.1	42.8	0.097	1.56	2.06	23.1	13.9	
	25-32	Bt3	0.5	0.7	1.9	23.7	13.0	39.8	20.6	39.6	0.048	1.58	1.82	21.2	13.2	
	32-47	Bt4	0.6	0.6	2.0	23.4	13.3	39.9	17.8	42.3	0.062	1.56	1.88	23.1	14.8	
	47-67	Bt5	0.6	0.8	1.8	19.1	15.0	37.3	21.9	40.8	0.050	1.73	2.01	18.7	13.2	
	67-80	Bct	0.3	0.6	1.4	9.4	10.7	22.4	35.7	41.9	0.036	1.79	1.99	16.6	13.3	
	80-90	CB	0.3	0.7	0.9	3.3	12.7	17.9	42.5	39.6	0.048	1.68	1.96	18.9	11.5	
		0-6	A	tr	0.2	0.6	20.2	29.9	50.9	31.3	17.8	0.013	1.54	1.60	16.4	6.8
		6-14	Bw	tr	0.1	0.4	9.2	29.4	39.1	40.7	20.2	0.043	1.40	1.59	18.3	8.2
		14-23	AB	tr	0.1	0.8	11.2	21.6	33.7	37.8	28.5	0.034	1.50	1.66	17.6	10.7
23-37		Bk1	tr	0.1	0.9	12.8	18.8	32.6	39.8	27.6	0.047	1.61	1.85	17.3	9.9	
37-51		Bk2	0.1	0.1	1.8	18.6	17.6	38.2	34.8	27.0	0.023	1.68	1.80	14.5	9.6	
51-71		Bk3	0.2	0.4	5.1	25.5	16.8	48.0	29.1	22.9	0.022	1.64	1.75	14.4	8.5	
93P00600	71-83	Bw2	tr	0.3	5.8	29.8	19.0	54.9	26.6	18.5	0.009	1.76	1.81	13.8	6.8	
Footnotes																

Footnotes

1 Analyses by Soil Survey Laboratory, USDA-NRCS, Lincoln, Nebraska

2 Location of pedon sample is the same as that given in the series as described in the section "Soil Series and Their Morphology."

Table 30.--Chemical Analyses of Selected Soils

(Dashes indicate analyses were not made)

Soil name and sample number	Depth	Horizon	Organic carbon	pH 1:1 (soil: water)	Extractable bases				Total Acidity	Cation Exchange capacity (pH 7) (NH ₄ OAc)	Base Saturation (NH ₄ OAc)	Exchangeable Sodium (ESP)	Calcium Carbonate Equivalent	Electrical Conductivity
					Ca	Mg	K	Na						
			Pct	pH						Pct	Pct	Pct	Pct	dS/m
Bluegrove (1,3) S92TX-503-007	In													
	0-5	A	1.23	6.4	5.2	1.2	0.2	0.1	3.9	7.7	87	1	---	---
	5-9	Bt1	0.73	6.4	6.1	2.6	0.2	0.2	4.8	10.7	85	2	---	---
	9-19	Bt2	0.85	6.4	11.7	6.2	0.3	0.2	9.0	22.4	82	1	---	---
	19-29	Bt3	0.63	6.5	12.9	7.2	0.2	0.2	8.7	23.6	87	1	---	---
	29-34	BCt	0.46	6.6	10.3	5.7	0.2	0.2	6.1	18.4	89	1	---	---
	34-43	R	0.10	7.7	5.9*	1.5	tr	0.1	3.2	6.0	100	2	---	---
Gowen (1,3) S92TX-503-004	0-4	A1	2.04	7.2	15.2*	2.4	1.0	0.1	0.4	17.9	100	1	---	---
	4-12	A2	0.77	7.1	11.8	2.0	0.8	0.1	1.1	15.0	98	1	---	---
	12-23	A3	0.74	7.0	10.9	1.5	0.5	0.1	1.5	13.2	98	1	---	---
	23-30	AB	0.48	7.1	11.8	1.8	0.3	0.1	0.7	14.4	97	1	---	---
	30-41	Bw	0.28	7.2	10.7	1.8	0.3	0.1	0.6	13.1	98	1	---	---
	41-51	AB	0.28	7.4	12.2	2.4	0.3	0.1	0.6	15.2	99	1	---	---
	51-57	Bw1	0.17	7.7	11.1*	2.6	0.3	0.1	2.3	14.0	100	1	---	---
	57-75	Bw2	0.15	8.5	35.0*	4.5	0.2	0.2	---	13.7	100	1	3	---
	75-85	Bw3	0.13	8.5	38.0*	6.4	0.2	0.3	---	---	100	2	4	---
Jolly (1,3) S92TX-503-006	0-3	A1	0.93	6.2	4.0*	1.1	0.4	tr	3.5	5.4	100	---	---	---
	3-7	A2	0.51	6.6	3.6	1.2	0.5	tr	3.1	12.0	44	---	---	---
	7-15	Bt	0.46	6.9	8.3*	2.7	0.3	tr	5.3	11.1	100	---	---	---
	15-20	BCt	0.47	7.1	7.7	2.6	0.3	tr	5.6	10.9	97	---	---	---
	20-26	Cr	0.01	7.4	3.8*	1.2	0.2	tr	3.1	5.2	100	---	---	---

Table 30.--Chemical Analyses of Selected Soils--Continued

Soil name and sample number	Depth	Horizon	Organic carbon	pH 1:1 (soil: water)	Extractable bases				Total Acid-ity	Cation Exchange capacity (pH 7) (NH ₄ OAc)	Base Satur-ation (NH ₄ OAc)	Exchang-eable Sodium (ESP)	Calcium Carbon-ate Equivalent	Electrical Conduct-ivity		
					Ca	Mg	K	Na								
				Meq/100gm								Pct	Pct	Pct	dS/m	
Kamay (1,2) S92TX-503-002	In		Pct	pH												
	0-5	A1	1.37	6.2	8.2	2.6	0.9	0.1	4.7	13.5	87	1	---	--		
	5-12	A2	0.76	6.2	8.3	3.4	0.3	0.1	3.2	13.9	87	1	---	--		
	12-23	Bt	0.72	7.9	15.3*	10.7	0.4	1.8	2.3	28.1	100	6	---	--		
	23-33	Btk1	0.46	8.6	17.7*	10.8	0.3	2.9	---	24.9	100	10	1	--		
	33-44	Btk2	0.22	7.7	25.4*	10.4	0.3	4.8	---	21.7	100	13	1	--		
	44-52	Btk3	0.17	8.0	26.5*	10.0	0.3	5.3	---	19.7	100	17	1	--		
	52-63	BCtk1	0.10	8.1	17.5*	6.7	0.2	4.2	---	14.2	100	16	tr	--		
	63-74	BCK2	0.03	8.1	20.9*	5.9	0.1	3.8	---	13.1	100	14	3	--		
	74-84	Cr	0.10	8.1	14.9*	5.1	2.6	2.6	---	10.6	100	13	tr	--		
Newcastle (1,2) S92TX-503-005	0-4	A	1.13	6.4	11.1	4.5	0.7	0.1	0.6	18.1	91	1	--	--		
	4-9	Bt1	0.45	6.4	12.3	5.4	0.9	0.1	0.8	20.0	94	1	--	--		
	9-21	Bt2	0.45	7	10.9	4.4	0.6	0.1	1.2	17.0	94	1	--	--		
	21-30	Bt3	0.3	7.3	7.6*	3.3	0.2	tr	2.0	11.1	100	--	--	--		
	30-33	Bt4	0.29	7.4	7.8	3.5	0.2	tr	4.4	11.8	97	--	--	--		
	33-44	Cr/Bt	0.05	7.7	8.2	2.7	0.3	tr	---	---	---	--	--	--		

Table 30.--Chemical Analyses of Selected Soils--Continued

Soil name and sample number	Depth	Horizon	Organic carbon	pH 1:1 (soil: water)	Extractable bases				Total Acid-ity	Cation Exchange capacity (pH 7) (NH ₄ OAc)	Base Satur-ation (NH ₄ OAc)	Exchang-eable Sodium (ESP)	Calcium Carbon-ate Equivalent	Electrical Conduct-ivity
					Ca	Mg	K	Na						
Meq/100gm														
In	pH	Pct							Pct	Pct	Pct	Pct	Pct	dS/m
Weswind (1,2) S92TX-503-001	0-4	A1	1.14	6.4	5.6	1.3	0.6	0.1	1.1	8.0	95	1	--	--
	4-11	A2	0.55	6.1	5.2	1.7	0.5	0.1	1.4	8.3	90	1	--	--
	11-17	Bt1	0.55	6.2	9.0*	3.9	0.5	0.2	2.5	9.1	100	2	--	--
	17-25	Bt2	0.54	6.5	11.6	5.9	0.3	0.1	4.9	20.0	90	1	--	--
	25-32	Bt3	0.45	6.9	11.3*	5.5	0.5	0.4	2.5	12.0	100	3	--	--
	32-47	Bt4	0.33	7.6	11.4	6.0	0.4	0.5	2.9	18.4	99	3	--	--
	47-67	Bt5	0.10	8.2	15.6*	5.9	0.4	1.5	0.3	18.0	100	7	tr	1.18
	67-80	Bct	0.11	8.1	15.7	6.5	0.3	1.9	1.6	19.0	100	7	--	2.39
	80-90	CB	0.08	8.1	25.9*	5.3	0.3	1.8	0.4	16.6	100	7	2.0	2.56
	Wheatwood (1,2) S92TX-503-003	0-6	A	0.89	8.0	24.7*	1.2	0.7	tr	0.9	11.0	100	--	1
6-14		Bw	0.48	8.3	39.4*	1.7	0.5	tr	--	10.7	100	--	5	--
14-23		AB	0.60	8.3	48.5*	2.8	0.5	tr	--	15.3	100	--	3	--
23-37		Bk1	0.41	8.4	44.3*	2.8	0.3	tr	--	13.9	100	--	6	--
37-51		Bk2	0.26	8.5	37.3*	3.2	0.3	0.2	--	14.7	100	1	6	--
51-71		Bk3	0.19	8.5	39.8*	2.4	0.3	0.2	--	11.2	100	2	5	--
71-83		Bw2	0.10	8.6	38.4*	2.1	0.2	0.2	--	8.9	100	2	5	--

Footnotes

* Extractable Ca may contain Ca from calcium carbonate or gypsum. CEC7 base saturation set to 100.

1 Analyses by Soil Survey Laboratory, USDA-NRCS, Lincoln, Nebraska

2 Location of pedon sample is the same as that given in the series as described in the section "Soil Series and Their Morphology."

Table 31.--Optical Grain Counts for Selected Soils

(Dashes indicate that the material was not detected. Analyses performed at USDA NRCS, National Soil Survey Laboratory, Lincoln, Nebraska.)

Soil sample and Laboratory number	Depth	Horizon	Dominant Mineral (1)												
			QZ	FK	FE	CD	CB	OP	MS	AO	PR	ZR	TM	CA	BT
Bluegrove (2,3) S92TX-503-007 93P00623	In														
	9-19	Bt2	99	tr	1	tr	---	---	---	---	---	---	tr	tr	---
Gowen (2,3) S92TX-503-004 93P00605	30-41	Bw	94	1	1	4	---	tr	tr	---	---	---	tr	---	tr
Jolly (2,3) S92TX-503-006 93P00618	7-15	Bt	96	2	1	1	---	---	tr	---	---	---	---	---	tr
Newcastle (2,3) S92TX-503-005 93P00612	9-21	Bt2	95	3	---	1	---	1	---	---	1	---	---	---	---
Wheatwood (2,3) S92TX-503-003 93P00598	37-51	Bk2	86	5	tr	3	4	1	---	tr	tr	---	---	2	tr

Footnotes

- 1 QZ-Quartz; FK-Feldspar; FE-Iron Oxides (Goethite); CD-Chert (Chalcedony); CB-Carbonate Aggregates; OP-Opagues; MS-Muscovite; AO-Aragonite; PR-Pyroxene; ZR-Zircon; TM-Tourmaline; CA-Calcite; BT-Biotite;
- 2 Fine sand fraction
- 3 Location of pedon sample is the same as that given in the series as described in the section "Soil Series and Their Morphology."

Soil Survey of Young County, Texas

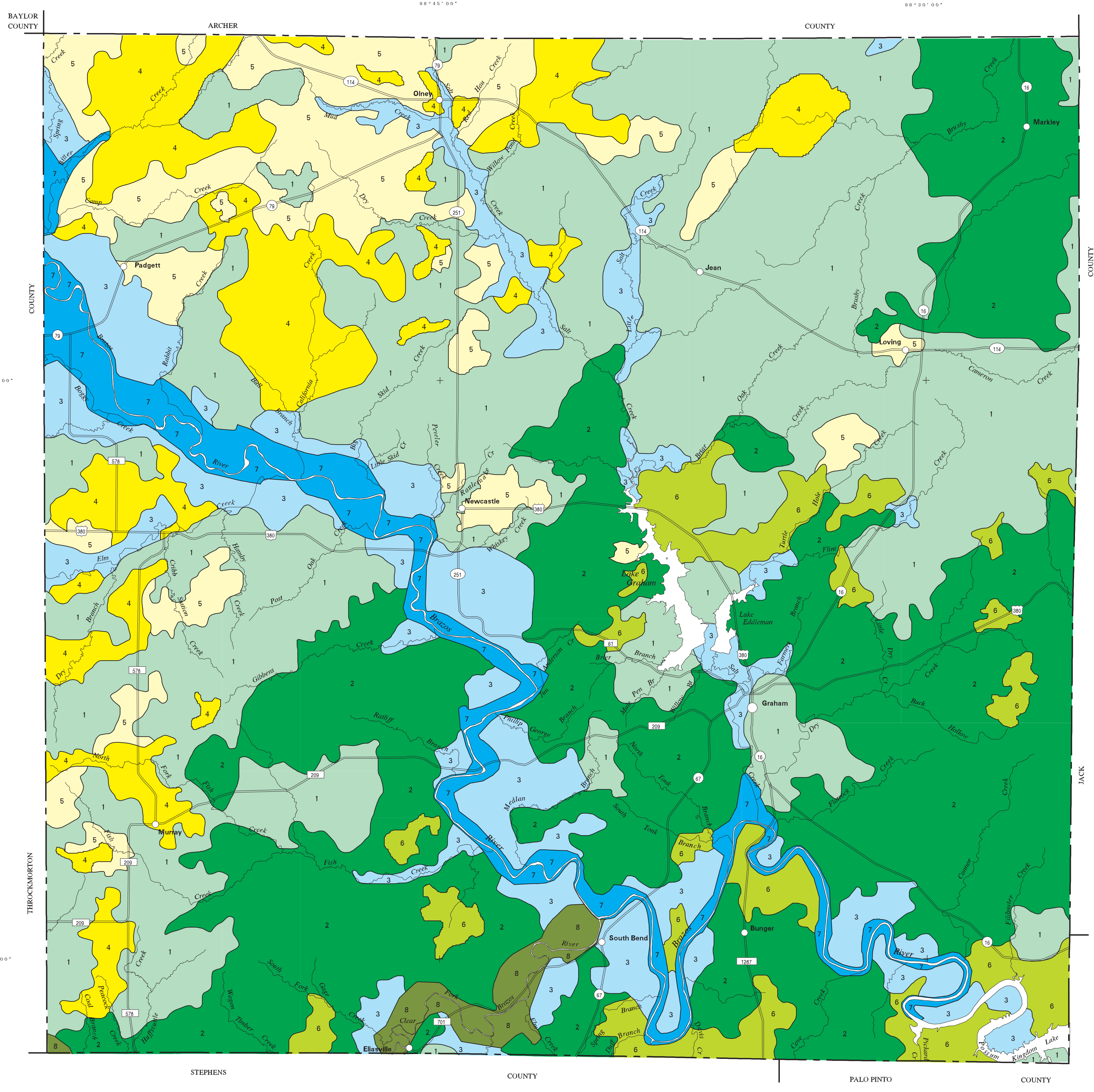
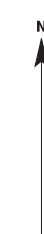
Table 32.--Taxonomic Classification of the Soils

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series.)

Soil name	Family or higher taxonomic class
Abilene-----	Fine, mixed, superactive, thermic Pachic Argiustolls
Anocon-----	Fine, mixed, active, thermic Udic Argiustolls
Bastrop-----	Fine-loamy, mixed, active, thermic Udic PaleustalFs
Bluegrove-----	Fine, mixed, active, thermic Typic HaplustalFs
Bonti-----	Fine, mixed, active, thermic Ultic PaleustalFs
Callahan-----	Fine, mixed, active, thermic Typic HaplustalFs
Chaney-----	Fine, mixed, active, thermic Oxyaquic PaleustalFs
Clearfork-----	Fine-silty, mixed, active, thermic Cumulic Haplustolls
Deandale-----	Fine, smectitic, thermic Vertic Paleustolls
Decordova-----	Coarse-loamy, siliceous, active, thermic Udic PaleustalFs
Enterprise-----	Coarse-silty, mixed, superactive, thermic Typic Haplustepts
Exray-----	Clayey, mixed, active, thermic, shallow Typic HaplustalFs
Gageby-----	Fine-loamy, mixed, superactive, thermic Cumulic Haplustolls
Goodnight-----	Mixed, thermic Typic Ustipsamments
Gowen-----	Fine-loamy, mixed, superactive, thermic Cumulic Haplustolls
Grandfield-----	Fine-loamy, mixed, superactive, thermic Typic HaplustalFs
Grandmore-----	Fine-loamy, mixed, active, thermic Typic HaplustalFs
Harpersville-----	Clayey, mixed, active, calcareous, thermic, shallow Aridic Ustorthents
Heaton-----	Loamy, siliceous, semiactive, thermic Arenic PaleustalFs
Hensley-----	Clayey, mixed, active, thermic Lithic RhodustalFs
Jacksboro-----	Clayey-skeletal, mixed, active, thermic Lithic HaplustalFs
Jolly-----	Loamy, siliceous, active, thermic, shallow Typic HaplustalFs
Kamay-----	Fine, smectitic, thermic Typic PaleustalFs
Knoco-----	Clayey, mixed, active, calcareous, thermic, shallow Aridic Ustorthents
Leeray-----	Fine, smectitic, thermic Typic Haplusterts
Lincoln-----	Sandy, mixed, thermic Typic Ustifluvents
Lindy-----	Fine, mixed, active, thermic Udic HaplustalFs
Loving-----	Loamy, siliceous, active, nonacid, thermic, shallow Typic Ustorthents
Minwells-----	Fine, mixed, active, thermic Udic PaleustalFs
Newcastle-----	Fine-loamy, siliceous, superactive, thermic Typic HaplustalFs
Nukrum-----	Fine, smectitic, thermic Vertic Haplustolls
Owens-----	Fine, mixed, active, thermic Typic Haplustepts
Padgett-----	Fine, mixed, active, thermic Chromic Haplusterts
Palopinto-----	Loamy-skeletal, mixed, superactive, thermic Lithic Haplustolls
Rowden-----	Fine, mixed, superactive, thermic Typic Argiustolls
Sagerton-----	Fine, mixed, superactive, thermic Typic Argiustolls
Set-----	Fine-silty, carbonatic, thermic Typic Calciustolls
Shatruce-----	Fine, mixed, superactive, thermic Typic PaleustalFs
Springcreek-----	Fine-loamy, carbonatic, thermic Typic Calciustolls
Throck-----	Fine, mixed, active, thermic Vertic Ustochrepts
Thurber-----	Fine, smectitic, thermic Typic HaplustalFs
Tillman-----	Fine, mixed, superactive, thermic Vertic Paleustolls
Truce-----	Fine, mixed, active, thermic Udic PaleustalFs
Vernon-----	Fine, mixed, active, thermic Typic Haplustepts
Westola-----	Coarse-loamy, mixed, superactive, calcareous, thermic Typic Ustifluvents
Weswind-----	Fine, mixed, semiactive, thermic Typic PaleustalFs
Wheatwood-----	Fine-silty, mixed, active, thermic Fluventic Haplustepts
Wichita-----	Fine, mixed, superactive, thermic Typic PaleustalFs
Winters-----	Fine, mixed, superactive, thermic Typic PaleustalFs

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LEGEND

- 1 Bluegrove-Newcastle-Jolly
- 2 Shatruce-Exray-Loving
- 3 Grandfield-Gowen
- 4 Tillman-Vernon
- 5 Sagerton
- 6 Set-Palopinto-Lindy
- 7 Lincoln-Westola-Padgett
- 8 Clearfork-Wheatwood

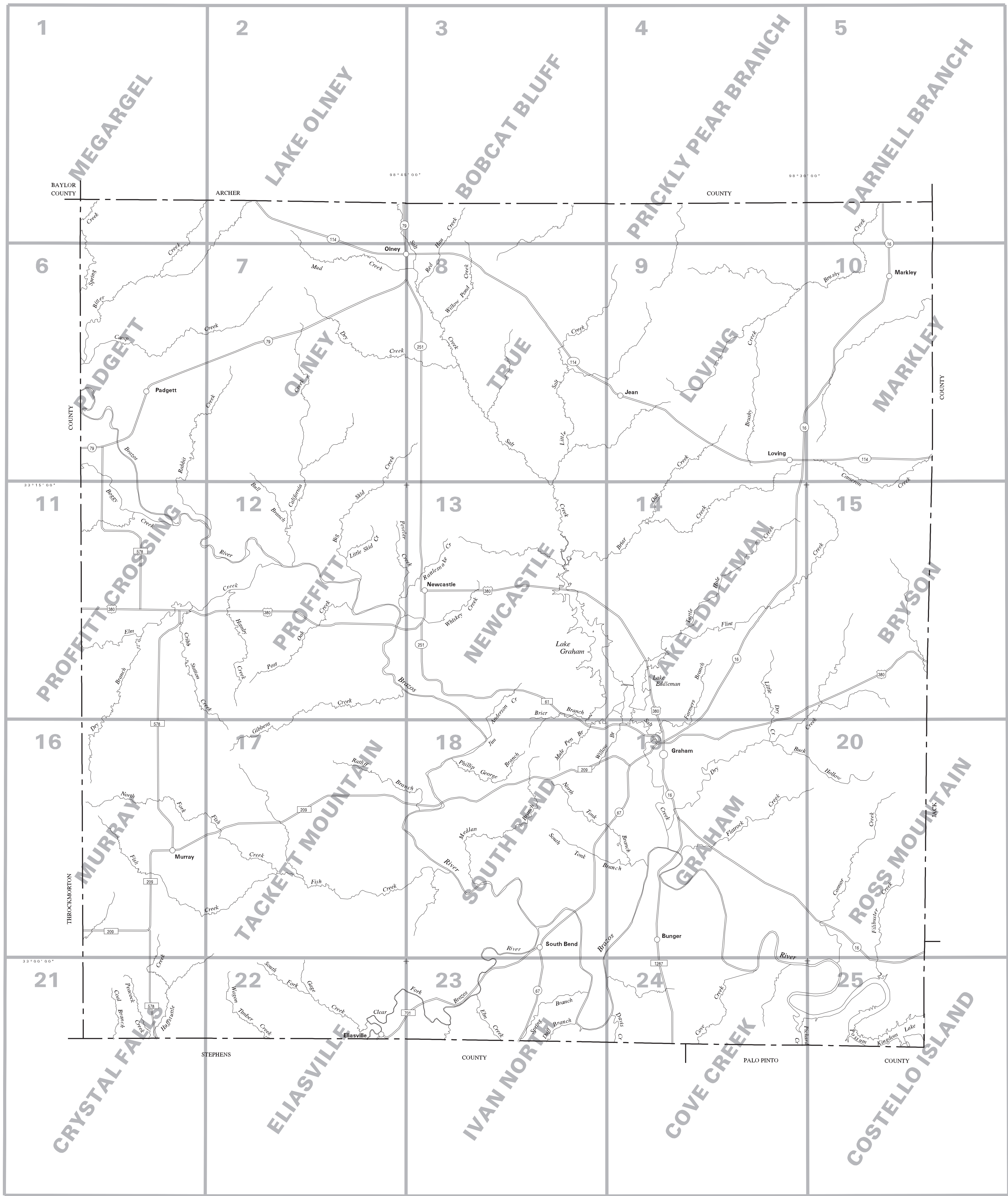
UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TEXAS AGRICULTURAL EXPERIMENT STATION
GENERAL SOIL MAP
YOUNG COUNTY, TEXAS

1 0 1 2 3
MILES

1 0 1 2 3 4 5 6
KILOMETERS

SCALE = 1:125000

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.



SOIL LEGEND

Map symbols consist of a combination of letters and numbers. The first capital letter is the initial of the first component name. The second letter is lowercase. The third letter is a capital letter that indicates slope class. The fourth part of the symbol, if used, is a number and represents erosion class. Symbols with all uppercase letters represent miscellaneous areas.

SYMBOL	NAME
AbA	Abilene loam, 0 to 1 percent slopes
AnB	Anocon fine sandy loam, 1 to 3 percent slopes
BgB	Bluegrove fine sandy loam, 1 to 3 percent slopes
BoB	Bonti fine sandy loam, 1 to 3 percent slopes
BpC	Bastrop loamy fine sand, 1 to 5 percent slopes
BsB	Bastrop fine sandy loam, 1 to 3 percent slopes
BsC2	Bastrop fine sandy loam, 1 to 5 percent slopes, moderately eroded
CaC2	Callahan loam, 2 to 5 percent slopes, moderately eroded
ChB	Chaney loamy fine sand, 0 to 3 percent slopes
CkA	Clearfork silty clay loam, 0 to 1 percent slopes, occasionally flooded
DAM	Dams
DeB	Decordova loamy fine sand, 0 to 3 percent slopes
DnB	Deandale loam, 0 to 2 percent slopes
EnB	Enterprise very fine sandy loam, 1 to 3 percent slopes
EnC	Enterprise very fine sandy loam, 3 to 5 percent slopes
ExD	Exray-Loving complex, 1 to 8 percent slopes, extremely stony
GaB	Gageby loam, 0 to 2 percent slopes, occasionally flooded
GdF	Goodnight loamy fine sand, 3 to 20 percent slopes
GeA	Gowen loam, 0 to 1 percent slopes, occasionally flooded
GfB	Grandfield loamy fine sand, 0 to 3 percent slopes
GnB	Grandfield fine sandy loam, 1 to 3 percent slopes
GnC	Grandfield fine sandy loam, 3 to 5 percent slopes
GrB	Grandmore fine sandy loam, 0 to 2 percent slopes
HeC	Heaton fine sand, 1 to 5 percent slopes
HnB	Hensley loam, 1 to 3 percent slopes
HsB	Hensley stony loam, 1 to 3 percent slopes, extremely stony
JaB	Jacksboro fine sandy loam, 1 to 3 percent slopes
JrE	Jolly-Rock outcrop complex, 2 to 12 percent slopes, stony
KaA	Kamay silt loam, 1 to 3 percent slopes
KvE	Knoco-Vernon complex, 3 to 12 percent slopes
KvG	Knoco-Vernon complex, 3 to 45 percent slopes, extremely bouldery
LeB	Leeray clay, 1 to 3 percent slopes
LnA	Lincoln sandy loam, 0 to 1 percent slopes, occasionally flooded
LyB	Lindy silt loam, 1 to 3 percent slopes
MwB	Minwells fine sandy loam, 1 to 3 percent slopes
NcB	Newcastle loamy fine sand, 1 to 3 percent slopes
NeB	Newcastle fine sandy loam, 1 to 3 percent slopes
NoC	Newcastle-Jolly complex, 1 to 5 percent slopes
NuA	Nukrum clay loam, 0 to 1 percent slopes
OhG	Owens-Harpersville complex, 8 to 45 percent slopes, extremely bouldery
OnE	Owens clay, 5 to 12 percent slopes, rubbly
Ow	Oil-waste land
PaA	Padgett clay, 0 to 1 percent slopes, occasionally flooded
PaD	Palopinto stony loam, 1 to 8 percent slopes, rubbly
QU	Pits, quarry
RwB	Rowden clay loam, 0 to 2 percent slopes
SaA	Sagerton loam, 0 to 1 percent slopes
SaB	Sagerton loam, 1 to 3 percent slopes
ScB	Springcreek loam, 1 to 3 percent slopes
SeB	Set clay loam, 1 to 3 percent slopes
SpG	Set-Palopinto complex 8 to 40 percent slopes, extremely stony
StF	Shatruce gravelly fine sandy loam, 8 to 30 percent slopes, rubbly
StG	Shatruce gravelly fine sandy loam, 12 to 50 percent slopes, very rubbly
ThB	Thurber clay loam, 1 to 3 percent slopes
TkC	Throck silty clay loam, 1 to 5 percent slopes
TmB	Tillman clay loam, 1 to 3 percent slopes
TrB	Truce fine sandy loam, 1 to 3 percent slopes
TrC	Truce fine sandy loam, 3 to 5 percent slopes
VeC	Vernon clay, 1 to 5 percent slopes
W	Water
WaA	Westola fine sandy loam, 0 to 1 percent slopes, occasionally flooded
WdB	Weswind fine sandy loam, 1 to 3 percent slopes
WeA	Wheatwood loam, 0 to 1 percent slopes, occasionally flooded
WhB	Wichita clay loam, 1 to 3 percent slopes
WtB	Winters loam, 1 to 3 percent slopes

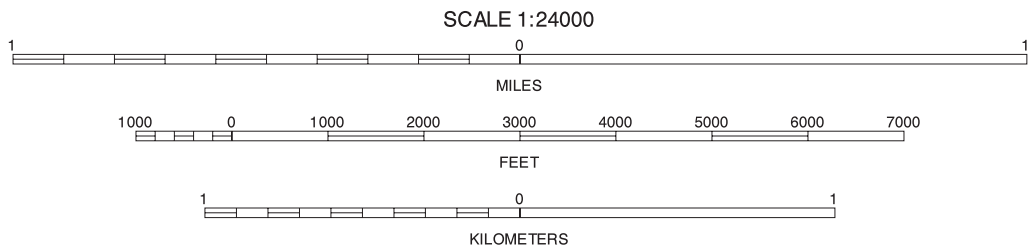
CONVENTIONAL AND SPECIAL
SYMBOLS LEGEND

CULTURAL FEATURES		SPECIAL SYMBOLS FOR SOIL SURVEY AND SSURGO	
BOUNDARIES	MISCELLANEOUS CULTURAL FEATURES	SOIL DELINEATIONS AND SYMBOLS	
National, state, or province	Farmstead, house (omit in urban areas)	LANDFORM FEATURES	
County or parish	Church	ESCARPMENTS	
Minor civil division	School	Bedrock	
Reservation (national forest or park, state forest or park)	Other Religion (label)	Other than bedrock	
Land grant	Located object (label)	Short steep slope	
Limit of soil survey (label) and/or denied access area	Tank (label)	Gully	
Field sheet matchline & neatline	Lookout Tower	Depression, closed	
Previously Published Survey	Oil and/or Natural Gas Wells	Sinkhole	
OTHER BOUNDARY (label)	Windmill	EXCAVATIONS	
Airport, airfield	Lighthouse	PITS	
Cemetery		Borrow pits	
City/county park		Gravel pit	
STATE COORDINATE TICK 1 890 000 FEET		Mine or quarry	
LAND DIVISION CORNER (section and land grants)		Landfill	
GEOGRAPHIC COORDINATE TICK		MISCELLANEOUS SURFACE FEATURES	
TRANSPORTATION		Blowout	
Divided roads		Clay spot	
Other roads		Gravelly spot	
Trail		Lava flow	
ROAD EMBLEM & DESIGNATIONS		Marsh or swamp	
Interstate		Rock outcrop (includes sandstone and shale)	
Federal		Saline spot	
State		Sandy spot	
County, farm or ranch		Severely eroded spot	
RAILROAD		Slide or slip	
POWER TRANSMISSION LINE (normally not shown)		Sodic spot	
PIPE LINE (normally not shown)		Spoil area	
FENCE (normally not shown)		Stony spot	
LEVEES		Very stony spot	
Without road		Wet spot	
With road			
With railroad			
Single side slope (showing actual feature location)			
DAMS			
Medium or Small			
LANDFORM FEATURES			
Prominent hill or peak			
Soil Sample Site			



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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Soil map delineations extending beyond the dashed white quadrangle nesline are for reference only and are included on adjacent map sheets. Digital data are available for this quadrangle.



QUADRANGLE LOCATION

MEGARGEL, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 1 OF 25

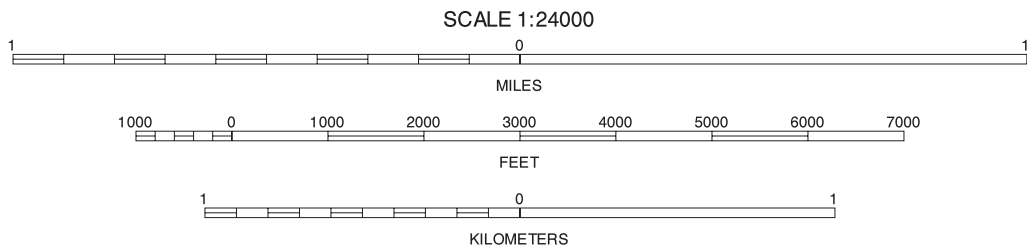
Joins sheet 2, Lake Olney

Joins sheet 1, Olney



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QUADRANGLE LOCATION

LAKE OLNEY, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 2 OF 25



Joins sheet 7,
Olney

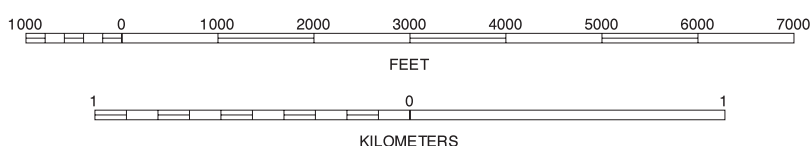
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the Natural Resources Conservation Service from 1994-1995 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Soil map delineations extending beyond the dashed white quadrangle neckline are for reference only and are included on adjacent map sheets. Digital data are available for this quadrangle.

NORTH

Joins sheet 8, True

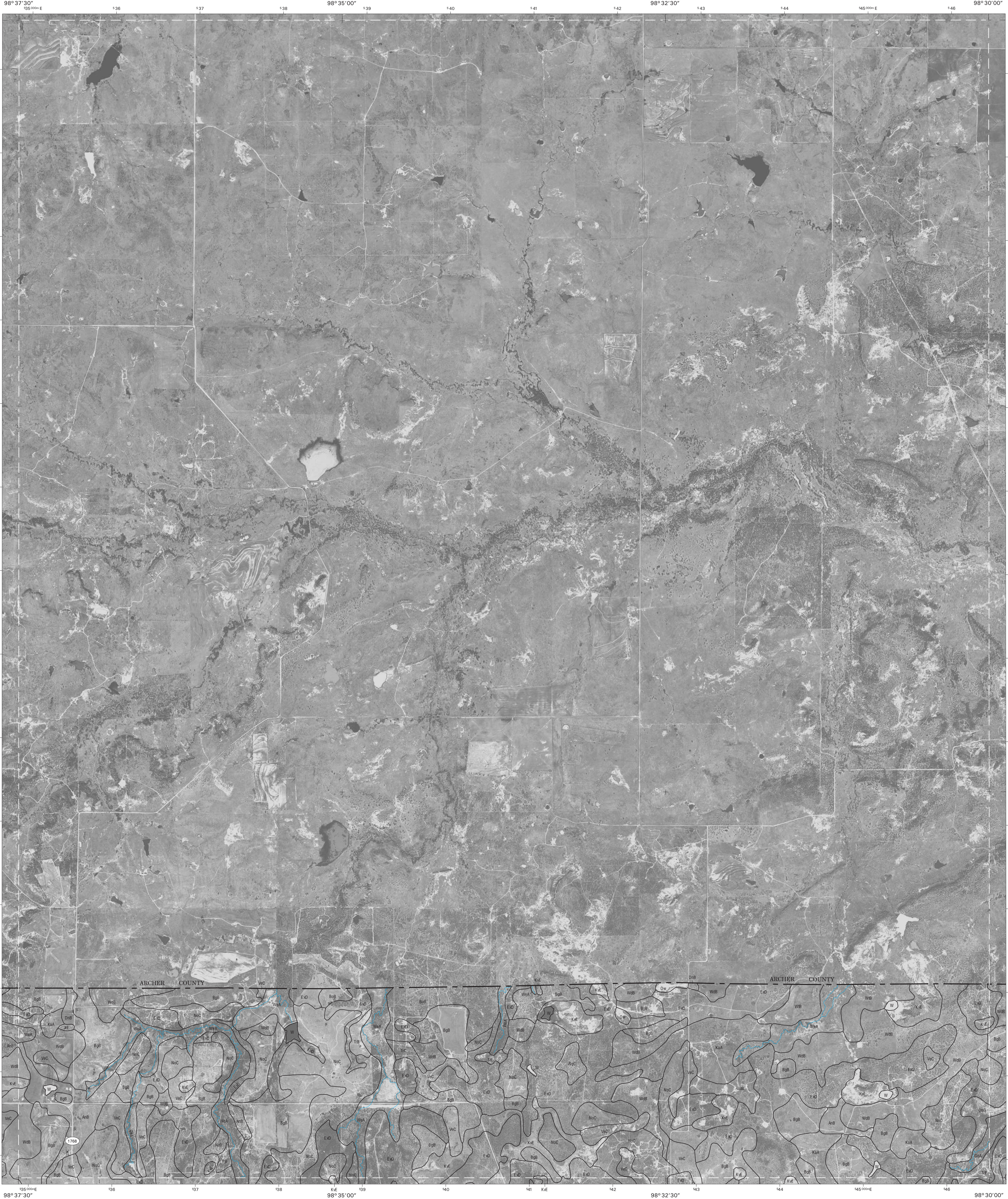
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QUADRANGLE LOCATION

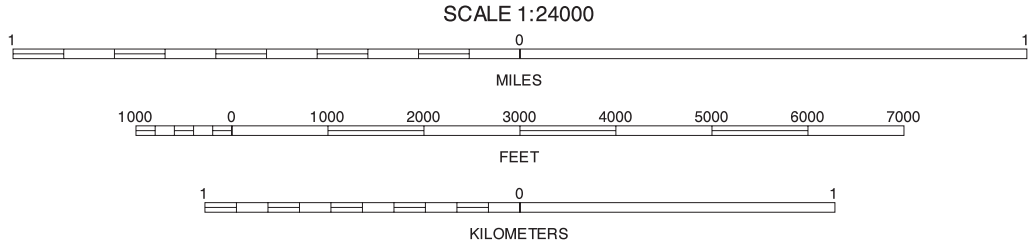
BOBCAT BLUFF, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 3 OF 25

Joins sheet 9,
Loving



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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Soil map delineations extending beyond the dashed white quadrangle neckline are for reference only and are included on adjacent map sheets. Digital data are available for this quadrangle.



QUADRANGLE LOCATION

PRICKLY PEAR BRANCH, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 4 OF 25



Join sheet 4, Prickly Pear Branch

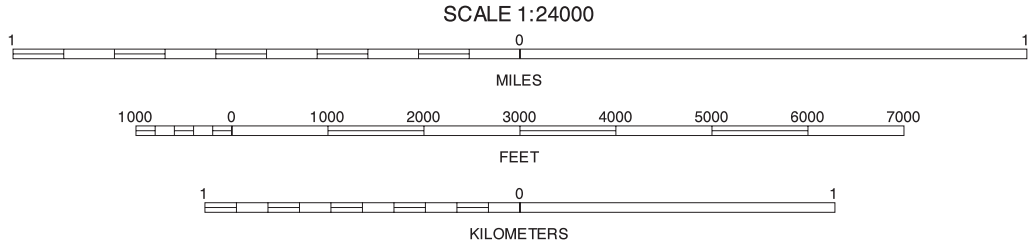
Join sheet 10, Markley

Join sheet 9, Loving

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NORTH

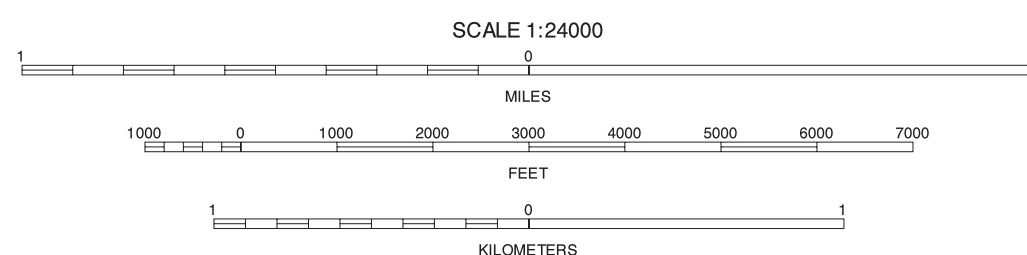


QUADRANGLE LOCATION

DARNELL BRANCH, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 5 OF 25



North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 14.
Coordinate grid ticks and land division data, if shown,
are approximately positioned. Soil map delineations
extending beyond the dashed white quadrangle neckline
are for reference only and are included on adjacent map
sheets. Digital data are available for this quadrangle.



PADGETT, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 6 OF 25

Joins sheet 1,
Hawthorn

Joins sheet 3,
Boscat Bluff

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

YOUNG COUNTY, TEXAS
OLNEY QUADRANGLE
SHEET NUMBER 7 OF 25

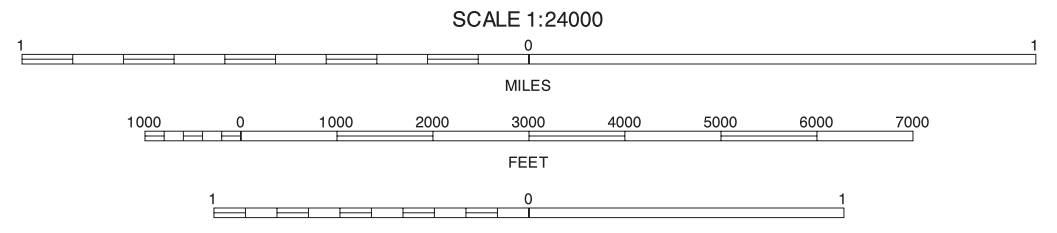


Joins sheet 11,
Proffitt Crossing

Joins sheet 13,
Newcastle

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QUADRANGLE LOCATION

OLNEY, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 7 OF 25

Joins sheet 2,
Lake Olney

Joins sheet 1,
Pucky Pass Branch

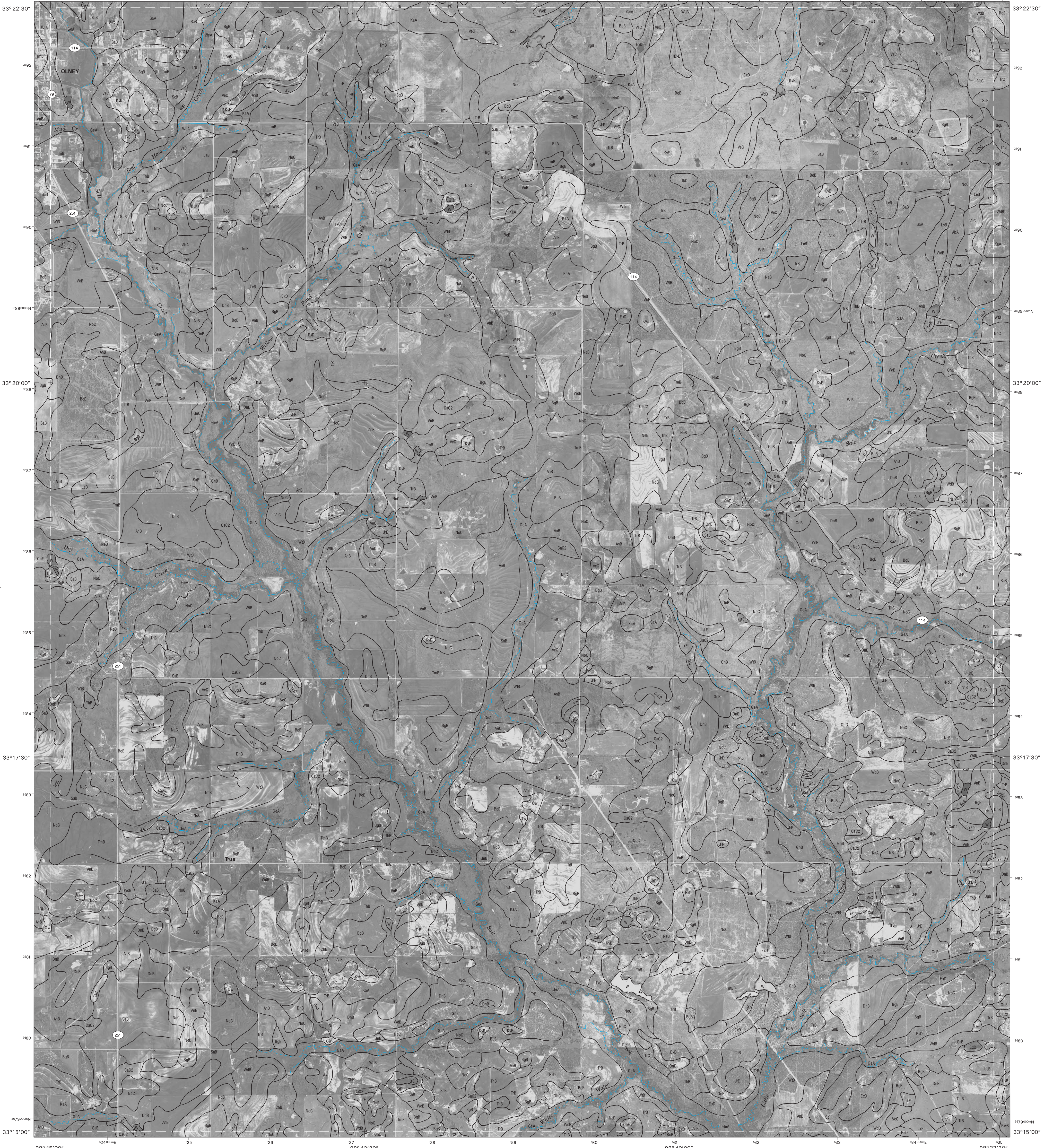
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

YOUNG COUNTY, TEXAS
TRUE QUADRANGLE
SHEET NUMBER 8 OF 25

Joins sheet 3, Bobcat Bluff

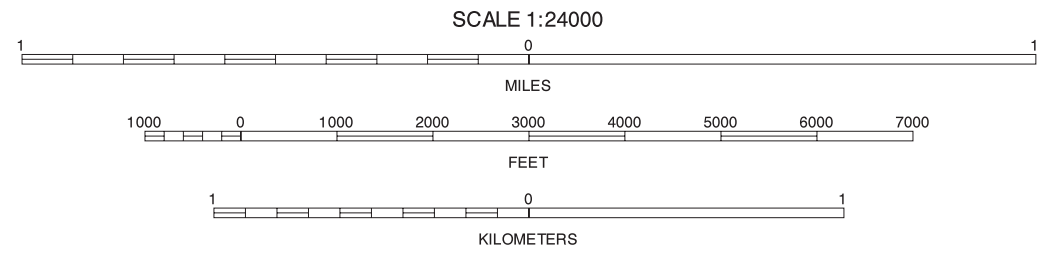
Joins sheet 14,
Lake Coleman

Joins sheet 12,
Piney Point



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TRUE, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 8 OF 25

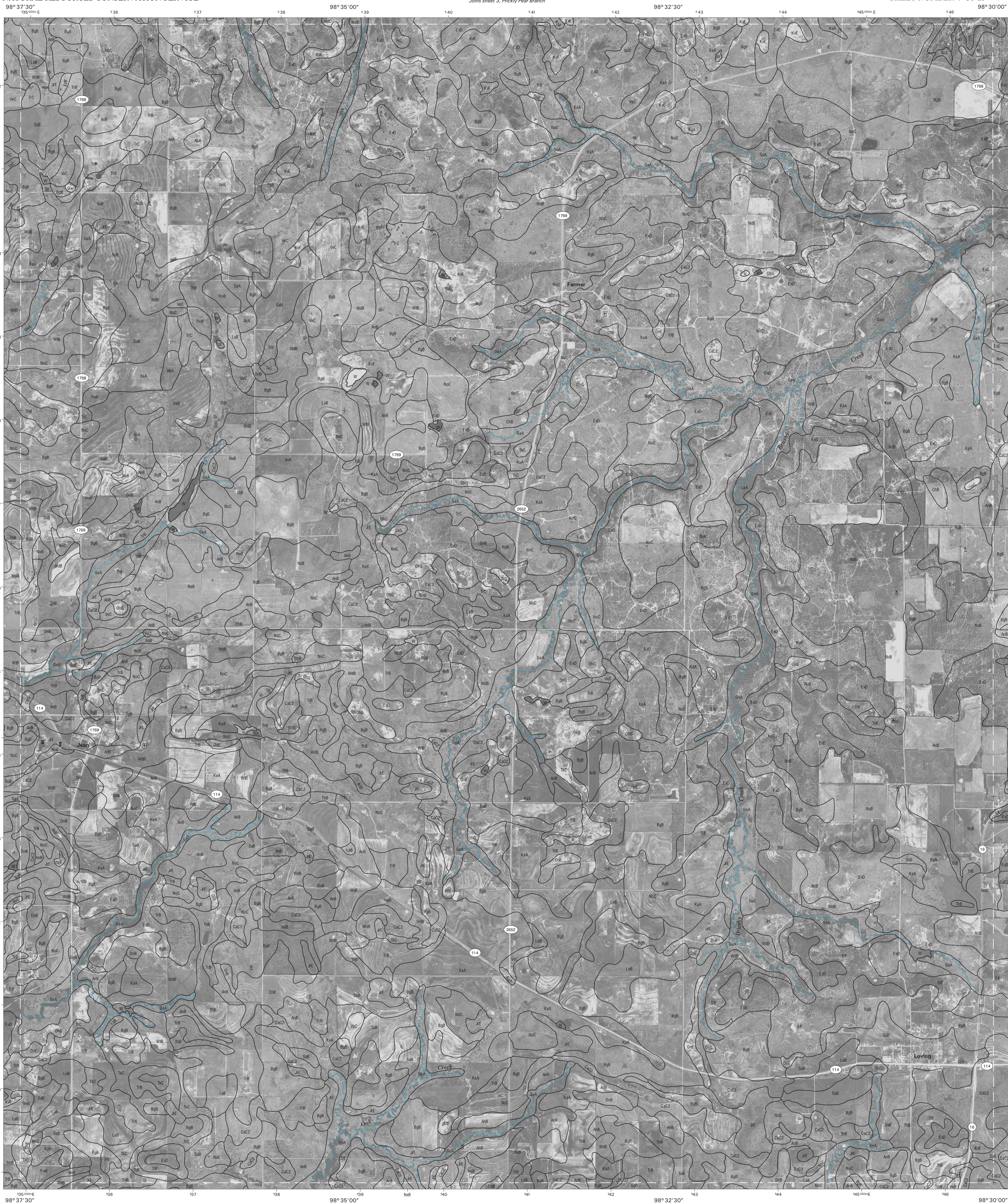
Joins sheet 2,
Savannah Bluff

Joins sheet 4,
Darnell Branch

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

YOUNG COUNTY, TEXAS
LOVING QUADRANGLE
SHEET NUMBER 9 OF 25

Joins sheet 3, Prickly Pear Branch



Joins sheet 7, True

Joins sheet 9, Markley

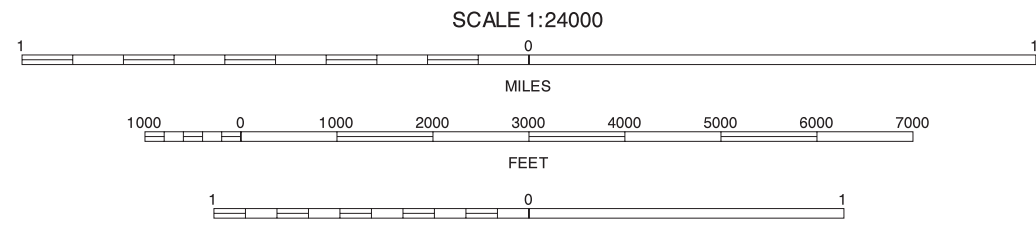
Joins sheet 12,
Newcastle

Joins sheet 14,
Bryant

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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Soil map delineations extending beyond the dashed white quadrangle nestline are for reference only and are included on adjacent map sheets. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

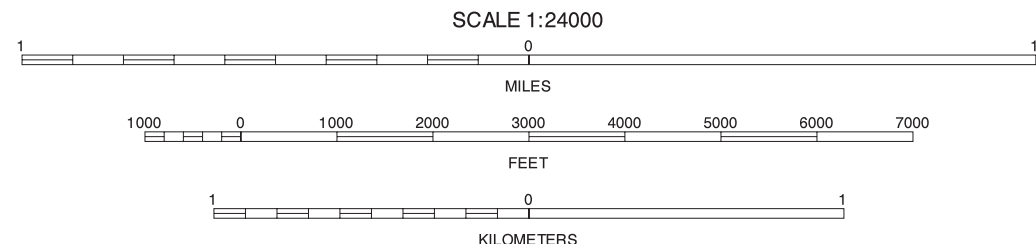
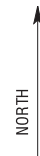
LOVING, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 9 OF 25

Joins sheet 5, Darnell Branch

Joins sheet 15, Bryson

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QUADRANGLE LOCATION

MARKLEY, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 10 OF 25

Joins sheet 6, Padgett

Joins sheet 7,
Olney



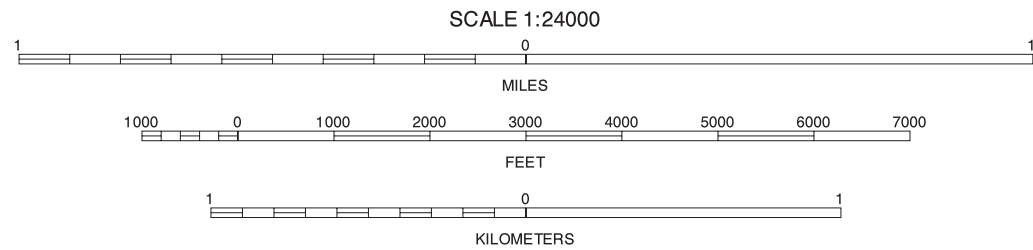
Joins sheet 16, Murray

Joins sheet 12, Proffitt

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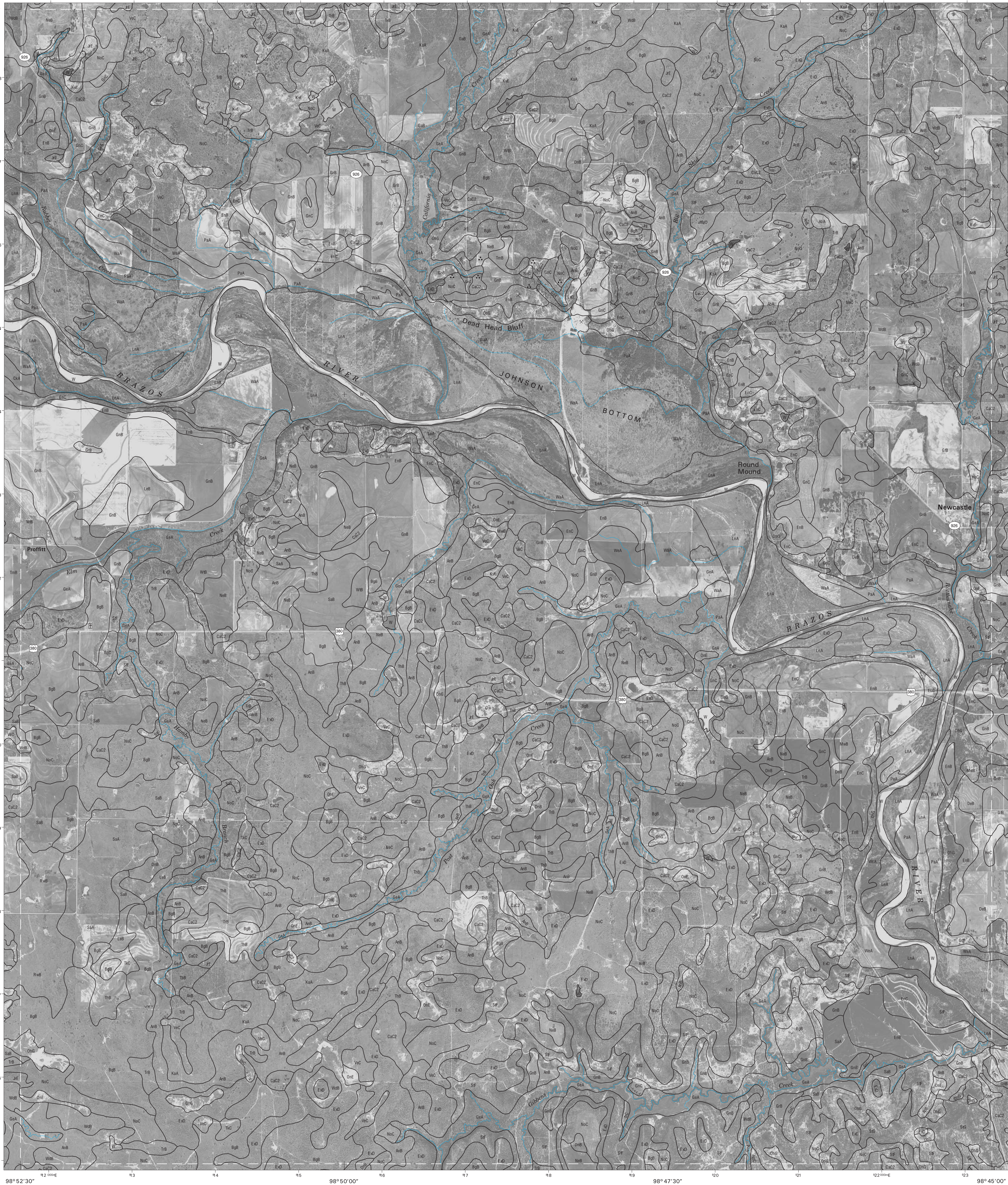
NORTH



QUADRANGLE LOCATION

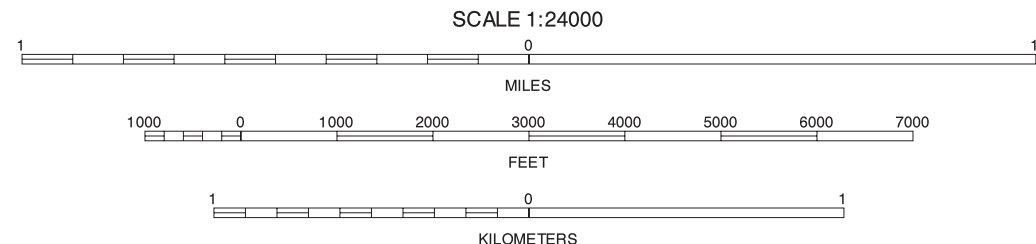
PROFFITT CROSSING, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 11 OF 25

Joins sheet 12,
Trevett Mountain



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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Soil map delineations extending beyond the dashed white quadrangle neeline are for reference only and are included on adjacent map sheets. Digital data are available for this quadrangle.



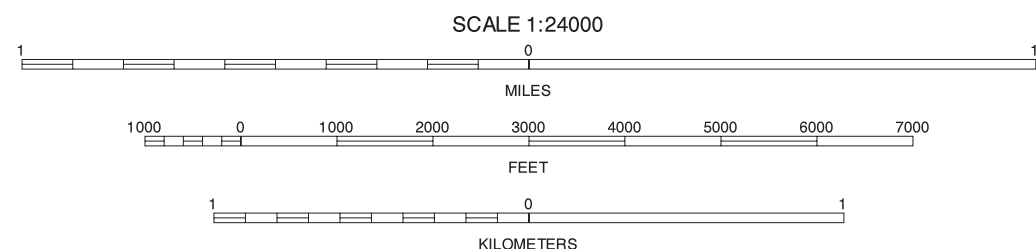
PROFFITT, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 12 OF 25



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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Soil map delineations extending beyond the dashed white quadrangle neeline are for reference only and are included on adjacent map sheets. Digital data are available for this quadrangle.

NORTH



NEWCASTLE, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 13 OF 25

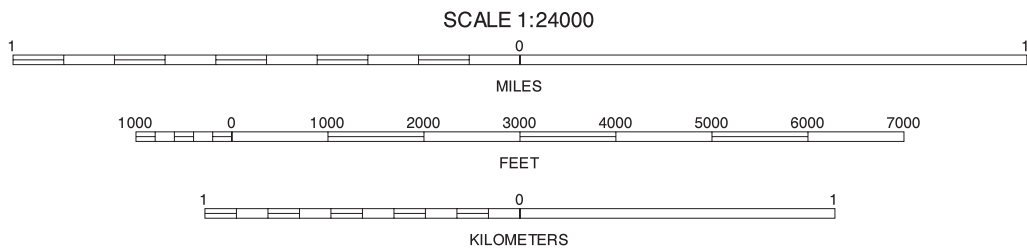
Joins sheet 10, Markley



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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Soil map delineations extending beyond the dashed white quadrangle nestline are for reference only and are included on adjacent map sheets. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

BRYSON, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 15 OF 25

Joins sheet 11, Profit Crossing

Joins sheet 12,
Profit



Joins sheet 21, Crystal Falls

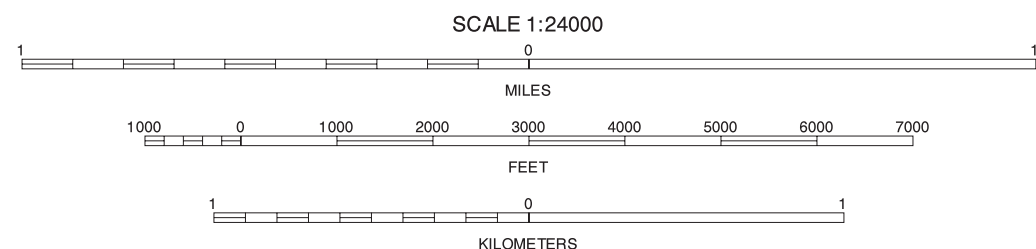
Joins sheet 17, Teakert Mountain

Joins sheet 22,
Eaville

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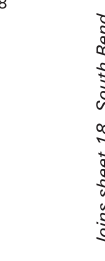
North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets. Digital data are available for this quadrangle.

NORTH



QUADRANGLE LOCATION

MURRAY, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 16 OF 25



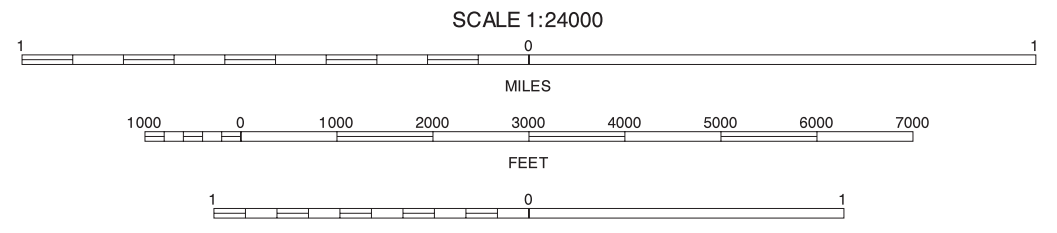
QUADRANGLE LOCATION

Joins sheet 4
Ivan North

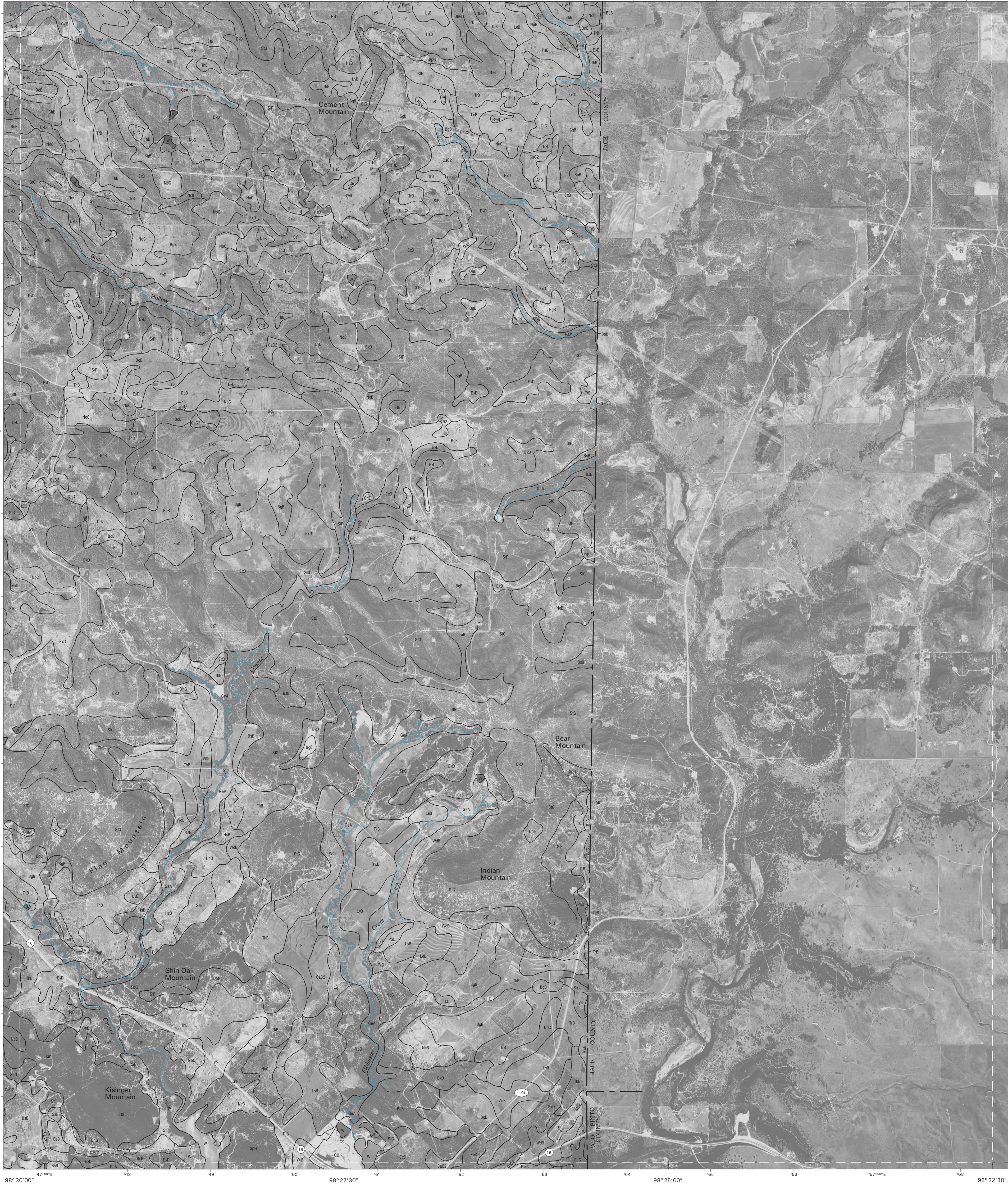


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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Soil map delineations extending beyond the dashed white quadrangle nestline are for reference only and are included on adjacent map sheets. Digital data are available for this quadrangle.

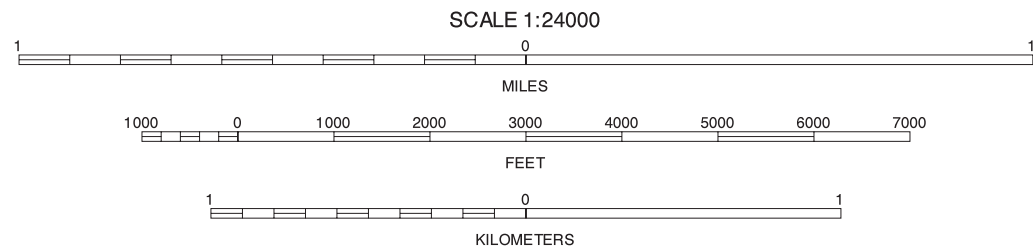


GRAHAM, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 19 OF 25

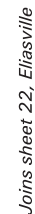


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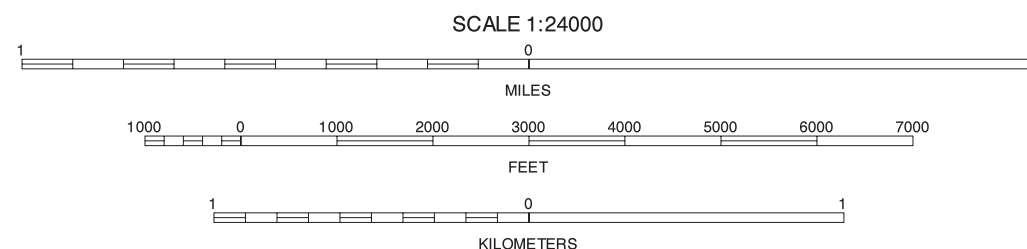
North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks; Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Soil map delineations extending beyond the dashed white quadrangle nestline are for reference only and are included on adjacent map sheets. Digital data are available for this quadrangle.



ROSS MOUNTAIN, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 20 OF 25



North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets. Digital data are available for this quadrangle.

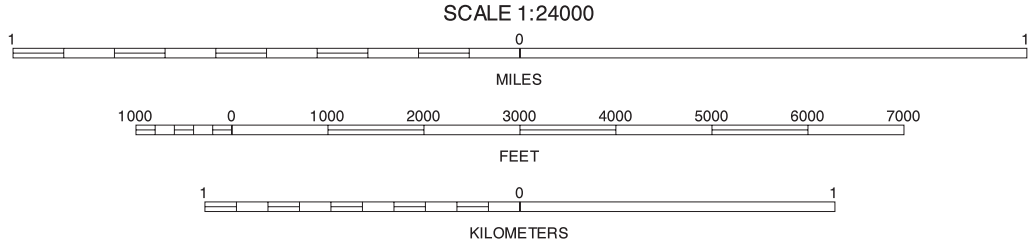


CRYSTAL FALLS, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 21 OF 25



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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets. Digital data are available for this quadrangle.



QUADRANGLE LOCATION

ELIASVILLE, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 22 OF 25

Joins sheet 12,
Rocky Mountain

Joins sheet 19,
Graham

Joins sheet 18, South Bend

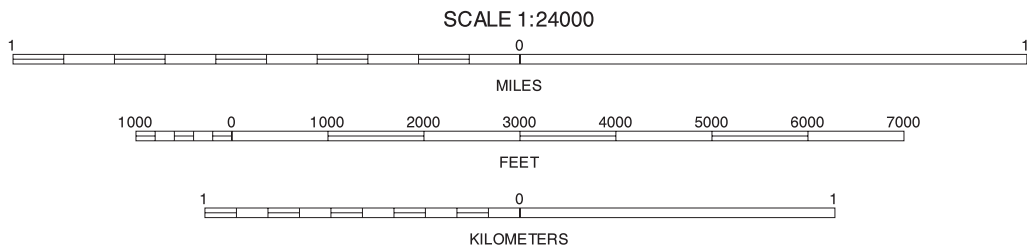


Joins sheet 22, Ellersville

Joins sheet 24, Crow Creek

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North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets. Digital data are available for this quadrangle.



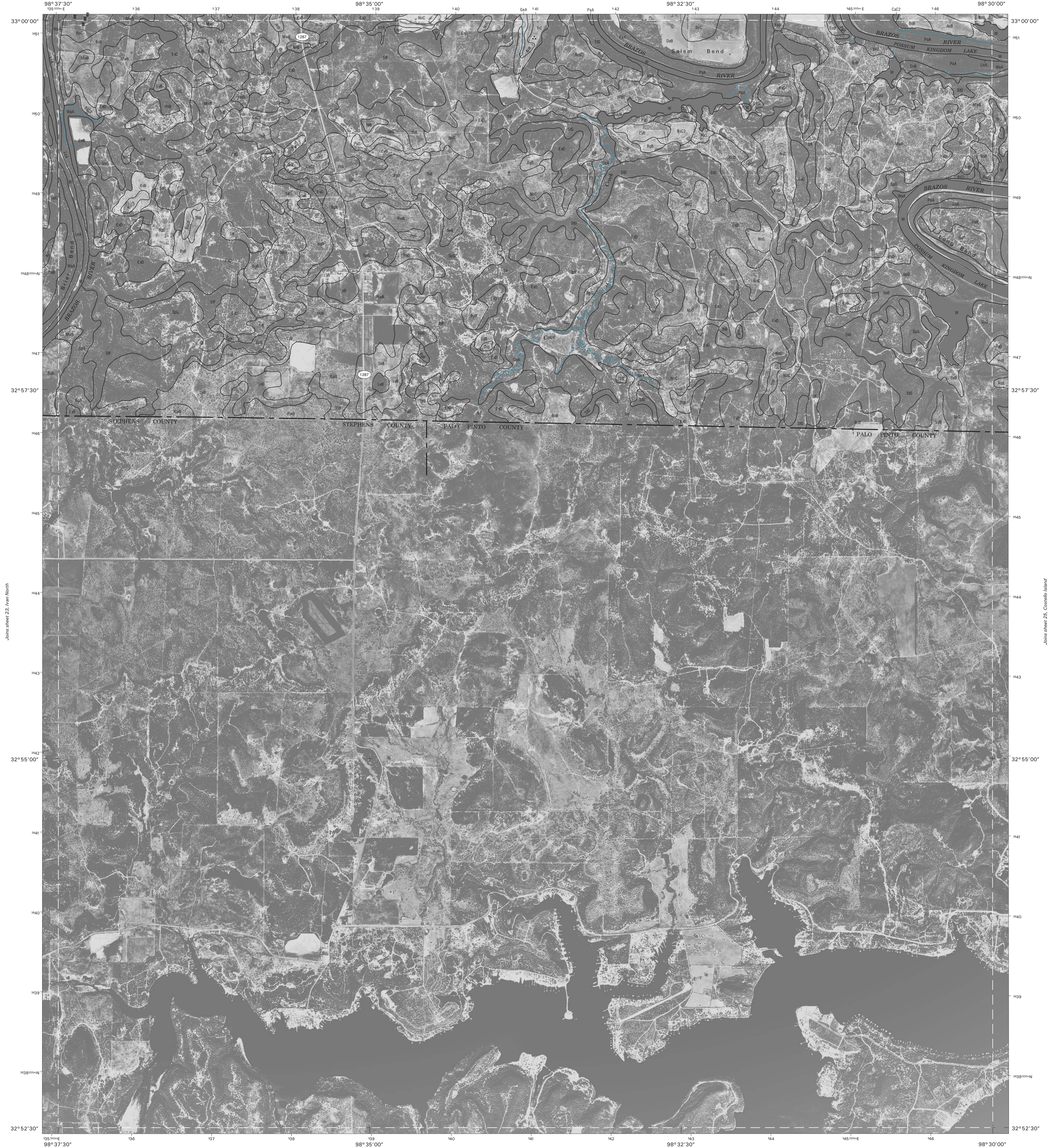
QUADRANGLE LOCATION

IVAN NORTH, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 23 OF 25

Joins sheet 18,
Cove Bend

Joins sheet 20,
Pecos Mountain

Joins sheet 19, Graham

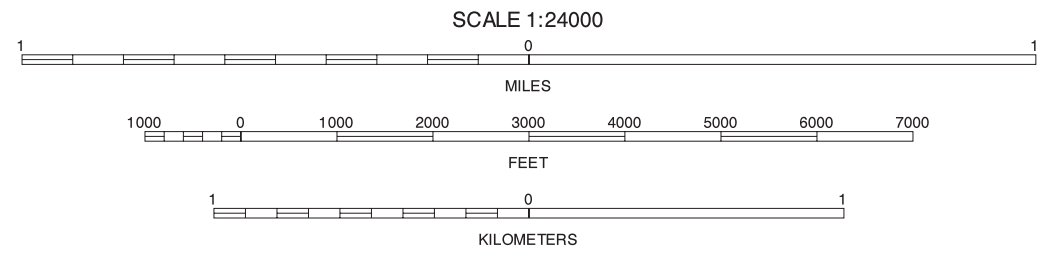


Joins sheet 23, Ivan North

Joins sheet 25, Coronado Island

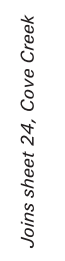
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the Natural Resources Conservation Service from 1994-1995 aerial photography.

North American Datum of 1983 (NAD83), GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Soil map delineations extending beyond the dashed white quadrangle nealline are for reference only and are included on adjacent map sheets. Digital data are available for this quadrangle.

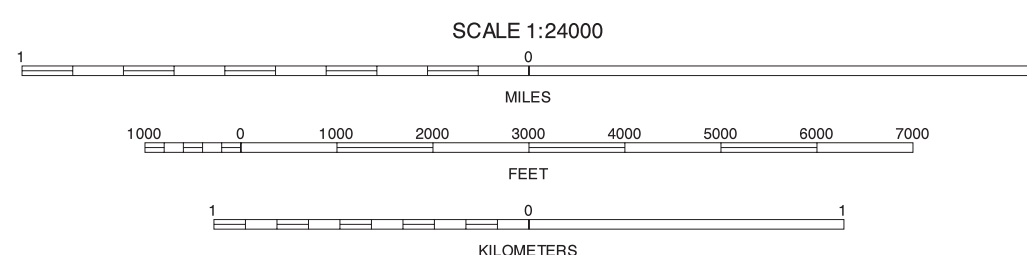


QUADRANGLE LOCATION

COVE CREEK, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 24 OF 25



North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 14.
Coordinate grid ticks and land division data, if shown,
are approximately positioned. Soil map delineations
extending beyond the dashed white quadrangle neatline
are for reference only and are included on adjacent map
sheets. Digital data are available for this quadrangle.



COSTELLO ISLAND, TEXAS
7.5 MINUTE SERIES
SHEET NUMBER 25 OF 25